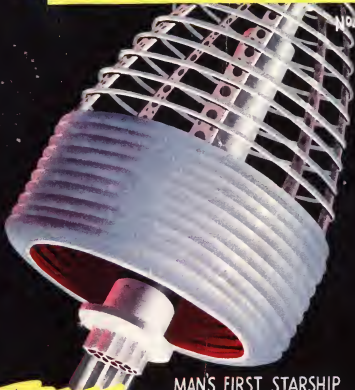


# Authentic

SCIENCE FICTION MONTHLY 1/6

№45



MAN'S FIRST STARSHIP



This month's  
FEATURED NOVEL

**SOME OTHER  
TIME**

**KENNETH BULMER**

Short Stories by: E. C. Tubb    George Paul Mann    Graham Winslow  
Features by: C. V. Jackson, F.R.S.A., Brian W. Aldiss, Frank Wilson, B.Sc.

VOLUME I No. 45  
ONE SHILLING and SIXPENCE

# Authentic

SCIENCE FICTION MONTHLY

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H. J. CAMPBELL

*Writes...*

Next month sees the biggest British science fiction fan event of the year—the National Convention. This year, for the first time since before the war, it is to be held outside London, and that makes it rather special. All the latest details of the Convention are given on pages 151 and 152. Remember, I will be there and looking out for readers. I'll have a name-tag on my lapel, so you'll be able to find me even if there are *other* beards about!

Now in this issue we have quite a line-up. Kenneth Bulmer, who has lately been making something of a name for himself with science fiction and whose short story appeared in *Authentic* last month, gives us the long novel, *Some Other Time*. You'll be wanting Bulmer again, we feel. E. C. Tubb, another young man who has rocketed to—as yet—minor fame in the field, returns to *Authentic* with his powerful short, *Death Deferred*. Makes you think, does Tubb.

G. P. Mann is a newcomer to the ranks of science fiction writing, though he has turned out a goodly number of thrillers. I think you will agree that his *Third Hand* indicates a latent talent for the field as well as a firm grasp of the writer's craft. *Dimensional Destiny* by Graham Winslow introduces another brand new writer to *Authentic's* column. His story will be grist to the mill of all those who like thinking around multidimensional ideas—and that seems to include most of you.

This month, too, we are giving you more non-fiction, since that is what you seem to want. Brian W. Aldiss sent me an article based on my remarks in a recent editorial about how science fiction should be written. You'll find it within. Let me know if you agree with him.

Looking to the future, the way we do, C. V. Jackson's article on medical progress by 2000 A.D. provides some talking points and thinking pivots, not so much as to whether

what he says will come true, as to the effect on our lives if it does come true. If nobody ever died, you know, we'd be in no end of a fix.

Our series on the solar system deliberately omitted mention of comets because it was thought that this subject deserved more space than could be given to it at that time. Now we give you full information about these remarkable celestial phenomena in John Tayne's *All About Comets*.

When John Christopher's story *Aristotle* appeared in *Authentic*, we got even more letters about logic than we usually get—and that is quite a few. Very many readers seem to be most interested in this "science of sciences," although they know very little about it. They feel that it is tremendously important in science, and they love stories of which it forms the basis. So I have commissioned Frank Wilson, a trained logician, to do us a series of articles on the subject. He calls his article in this issue *Logic is Fun*, and I must admit he does seem to have stripped away all the esoteric difficulties of the subject. He hopes in this series to put over enough logic in simple form to enable everyone to apply it successfully and to understand fully the stories

in which logic appears. If he does that, then he will have done a grand job.

Let me know what you think about all this. I don't want to make the mistake of giving you too academic stuff to read. If you find any articles difficult or dull or dry, please say so. Then I can do something about it. If I don't hear from you, I assume that you like what you are getting.

I should think you would agree with me on the interest of the new series on great men of science, the first of which, on Newton, appears in this issue. These I shall be writing myself, and my aim is not to tell you about the lives of these men in the biographical sense, but about their work and their effect on science. This way I hope to show you how science grew to its present form, the ideas and methods that were introduced to make it so, and indicate some of the unsolved fundamental problems that future scientists will have the pleasure of tackling and, we presume, solving. This, of course, is the basic raw material of science fiction.

Lastly, there is the article on the atomic submarine, the latest device of the future age. A pretty fair range of interest I think. Do you?

H.J.C.



*A curling tap and a walking doll.  
Fantastic? Yet they held the key to*

# SOME OTHER TIME

by

KENNETH BULMER



THE TAP CURLED itself up and shot a stream of hot water into his face.

He jumped back, startled, the tumbler falling from his hand onto the tiled floor, his mind completely refusing to believe what his eyes saw. His hand went instinctively to his face, wiped away the drops of moisture whilst he stared fascinatedly at the chrome water tap.

Tentatively, almost reluctantly, he reached out and touched the tap, felt its smooth, warm, damp chrome slick under fingers that trembled slightly. It was a perfectly ordinary tap. And yet—it had curled itself up like an elephant's trunk and squirted water all over his face.

He took a deep breath and shut his eyes.

He'd stepped into the wash-room from his office to get a drink. Everybody's always thirsty on Mars, even inside the pressurised domes with their trebly filtered air. Everything was normal. Then, when he'd bent down with the glass

in his hand, the water tap had curled up and——

Glass crunched under foot with the brittle snap of breaking dreams. His eyes opened and looked down as though they had never before seen a broken glass on a tiled wash-room floor. In an odd, sly fluidity of motion, his eyes went again to the tap. Little sharp gleams of light ran along its smooth chrome efficiency and the dampness was collecting into dwindling patches of mist along the faucet.

It was just a water tap.

Although his mouth and throat were parched, he had lost his desire for a drink of water. He needed something stronger right now. Shutting the door of the washroom behind him gave a frail sense of security, as though the thin plastic could bar whatever strange forces had been unloosed from penetrating into his office.

The whisky bottle chimed unevenly against the rim of the tumbler. He downed the burn-

ing stuff and struggled to prevent the wracking coughs that shook his body like an old tree groaning in the wind. When the spasm passed he spat into a paper towel. His life blood lay in a red thread across the paper. He grunted and pushed the paper towel down the dispenser.

Time! Everything was a scampering rush against a deadline. The final justification of all his work lay a month away, when his experiments would be complete. He had to last out. The two spots of red that fired his cheeks, offsetting the pallor of his face, told of the disease. He just had to ignore it.

"Doctor Carpenter! Are you feeling all right?"

"Of course, Louise." The reply was automatic, jerked from him without thought. He had not heard the outer door open, and now his secretary stood just inside, a worried, anxiously sympathetic expression doing nothing to hide the beauty of her face. Her immaculate white business suit,

flawless complexion and perfectly arranged dark hair were foils for the human warmth that lurked in her grey eyes.

"Of course I'm all right," Carpenter said again. "Just a cough."

"Well——" Louise said, reluctantly. She opened her notebook. "You have the two committee men to see at eleven; that's only an hour off. A call came in from Earth. Senator Charrington wants last month's reports amplified; not satisfied, he said. Oh, yes. Katrin's not well."

"Katrin? What's the matter?"

"I'm worried, Doctor. She just cries whenever anyone asks her. Something about a toy that was broken."

"It's not physical? She's not regenerating? No, she couldn't now, not at this stage. Has Armstrong seen her?"

"Yes. Doctor Armstrong spent a half hour talking to her this morning before you arrived." Louise's pencil tapped her notebook and her mouth was prim. "He came out of the



Nursery muttering to himself. I'm sure Katrin is not pretending."

"Pretending? Why should she?"

"Well, Doctor Armstrong——"

"I'll go over to the Nursery right away. This could be important, especially at this stage. There's only a month to go before the Congressional report and we daren't risk a single slip-up."

"What about the two committee men from Earth, Doctor?"

"Tell them to wait."

Carpenter was walking with his nervous, jerky stride through the open doorway, his thoughts going out towards the cluster of luxuriously furnished children's rooms under the wide glassite dome. His whole life's work, distilled and boiled down to bare essentials, scampered and gambolled in eight heedless, capricious, *new* children out there.

He was coughing again before he had reached the end of the corridor. His gaze went

to the filters over the air intakes. Nothing could go wrong there, he supposed, but the thought always rode dominant in his mind. Technical Services saw to the air purifying system, checking the intake plants and the blowers, ensuring a constant supply of sweet, Earth-normal air throughout the domed research station. It was not a pleasant conception—the idea of the tons of red dust and sand that blew forever over the surface of Mars being sprayed inside the domes.

Armstrong was waiting at the Nursery, a confident, almost arrogant smile plastered on his thick features. His white chemical-stained smock passed unnoticed by Carpenter—whose own lab coat was similarly soiled—but the impression he always gained from Armstrong was one of untidiness. Even his hair looked as though it had not been combed.

"Good morning, Doctor," Armstrong said.

"Where's Katrin?"

"Katrin? She's a little awkward at the moment, sir. I've put her in the observation pen."

Carpenter did not reply, but went quickly to the observation port and peered through the thick polarised glass into the nursery pen that lay beyond.

Katrin was a crumpled heap of rompers, sobbing miserably into the ear of her moulting teddy-bear.

Carpenter stepped up the microphone pick-up.

"... didn't believe me. You believe, teddy-bear, don't you? 'Cos Dolly did walk over to me. I saw her walk. I *did*!"

Carpenter swung round on Armstrong.

"What's all this about, Armstrong? Dolls walking?"

"Yes, sir. At least," Armstrong smiled the deprecating smile of an adult. "Katrin claims that her doll walked over to her."

Dolls walking. Taps that curled up . . .

Carpenter licked his lips and flicked off the microphone.

"Don't mention the subject to Katrin again. We'll see if any more comes of it. If you make a lot of fuss over these things, children balloon them up out of all proportion to their true value."

Carpenter's words were decisive, although his mind was crawling with half-frightened conjectures. He moved along the corridor and looked in at the play-pen observation window.

The other seven children were seriously occupied in the normal pursuits of nine-year olds. Carpenter's lips parted as he watched them and the hard fever-induced glitter in his eyes softened. These were the children of tomorrow. At least, the tomorrow of Mars.

He studied their massive chest development. Already they had the lung capacity of adolescence which, in a few more years, would be upon them, by which time they should have almost fully developed lung capacity. And that full development, although nowhere near enough

for life on the exterior surface of Mars, would make them far more fit for life on the arid, dusty planet than were any Earthpeople yet born.

It had been a great dream.

Now, with the flowering of the experiments and the fruits of the dream within his grasp, he dared not allow a single little thing to interfere with the next, logical step. After the congressional investigation committee had done their work, and had reported his full and unqualified success, he would go on, with more parents and more children.

He remembered the two committee men who had come up from Earth and cursed under his breath.

"Report anything else of a similar unlikely nature to me right away, Armstrong," he said, absently. "Don't make an issue of it with the children. Just accept what they say."

"But, sir. Surely if we allow any false impressions to become implanted——"

"For the moment, no questions and no doubts."

"Very well, Doctor."

Armstrong's bearing and voice spoke eloquently of his acid reproof. Carpenter studiously ignored that, and went back up the corridor with a perfunctory goodbye. He was coughing again by the time he had reached his office.

Louise was not there, and with a swift, furtive glance at the door of the washroom, he went on into the dimness of Laboratory Number One.

Lab. No. 1!

It was here, under the arching dome that had first risen to form the nucleus around which the rest of the research station had grown, that his theories had been put to the test ten years ago. He'd been twenty-six then. Behind him, ten years of agonised effort to bring himself up to the educational standard that warranted a degree and the microscopic, fragile beginnings of the dream. Then, at twenty-six, the swelling triumph of putting those theories to the test, financed by an eager congress back on Earth.

And after that? The slow dragging of the years whilst the eight children grew and matured, and unfolded before his critical, analytical eyes; the vindication of all his dreams.

Carpenter ran his fingers lovingly over the broad, bulky, sheet-enshrouded outlines of the X-ray machines. Soon, if all went well at the investigation committee meeting, those machines would once again quiver with life, would pour out their rays with fresh, willing volunteers as human targets.

The memory of the tap obtruded itself into his pleasant thoughts and he pulled his lower lip down absent-mindedly. There might be a connection between that and Katrin's doll. Then he straightened up and slapped his hand down hard on the flank of the X-ray machine.

What was coming over him? Worrying over a little girl's tale of her doll walking? He must be cracking up! Still . . .

Carpenter went back into his office, full of determination

to forget both incidents. So Senator Charrington wasn't satisfied with the last report? Well, for all Carpenter cared, he could go on being unsatisfied. Once he had been smoothly polite to the two committeemen he would be seeing in a few minutes, had convinced them that all was well at the Carpenter Eugenics Research Station, the meeting would be at hand and Charrington would hear everything along with the rest of the congressional investigation committee.

He went over to his desk and sat down.

The exclamation that was jerked from stunned lips came from some deep pit of his subconscious. He was sitting in an ungainly heap on the floor, one arm thrust backwards to prevent himself from rolling onto his back.

And the chair?

The richly-stained mahogany arm chair had skittered on rubbery legs from underneath him and scuttled across the office floor.

It was standing now silently against the side wall beside the filing cabinet.

Carpenter pushed himself to his feet and stood swaying slightly, his head moving from side to side like an inane dummy. He put his hands flat on the desk top and took a deep breath, staring at the chair.

He was still standing like that when Louise came into the room. She gave him one quick look.

"What's the matter, Doctor? Are you ill?"

"No. No, Louise." He wet his lips. "I'm all right. Nothing. Nothing at all."

"You look as though you've seen——"

"Well, I haven't. Not on Mars, anyway."

He laughed then, suddenly and painfully and wiped away the smear of blood that made his chin hideous. The paper towel in his hands ripped and tore apart and he saw that his hands were shaking uncontrollably.

He came round from the

desk and stood leaning against it, trying to smile, to take the lines of strain away from his face. Louise was white faced, puzzlement and a hurt look of frustration making him ache for her.

"It's all right, Louise, really. Just coughing."

"You ought to see Doctor Hamlin."

"It's not time for a check-up yet."

"All the same—I'll ring him for you, if you like."

"No, don't bother, Louise. I haven't time to see Hamlin now. Not with the final stages of the work so close."

"Well, all right." Louise came further into the office from where her first shocked reaction had stopped her. "What's your chair doing over there? I don't know. Efficiency around here is lax."

She began to walk towards the chair, silent and normal against the wall, her manner telling Carpenter just how much effort she was putting into acting in a natural way.

"Stop!" Carpenter flung out a hand. "*Don't touch it!*"

Louise stopped, startled. "What? Why——?"

Carpenter walked slowly over to the chair and smiled sickly at Louise. If anybody touched *that* chair now, it couldn't be her. He would have to pick it up and take it back where it belonged, behind his desk.

"Doctor Carpenter," Louise said. "What is the matter with you this morning? Are you sure I shouldn't ring Doctor Hamlin? He could be over here——"

"I'm perfectly sure, Louise. Now, please, no more questions." Carpenter spoke as brightly as he could. The girl would think him verging on a nervous breakdown if he carried on like this. He looked at the chair.

"Louise," he said, suddenly. "Just pop out and see if Armstrong has anything more to report about Katrin, will you? Just in case these two committee men decide to go nosing around."

"Why—all right, Doctor."

She went away, her chin high, wondering, Carpenter guessed miserably, why he wanted her out of the office. She knew that if he wished to be alone he only had to ask. She'd begin to wonder if something had occurred to make him angry with her.

The thought was a knife in his heart. What could he offer? A broken, fever-ridden doctor of thirty-six. Oh, sure, she loved him. He knew that. It had been the knowledge that there existed someone in whom he could have complete confidence, someone who wanted him, someone who loved him, that had kept him going during the latter years when it seemed that it would be easier to forget the whole thing and close up the Research station.

And now he was dwelling on those thoughts because he was afraid to pick up his own office chair.

Carpenter walked round the chair cautiously. He studied it morosely, noticing for the first

time the signs of age and wear that had worn the stain thin, so that the plastic showed through at back and seat edge.

He gulped, bent down and seized the chair in his fists, straightened and lifted it off the floor.

Held like this, with the back just under his nose, he was aware of something missing. Walking back to his desk, his legs quivering and threatening to let him down at every step, his mind sought for that missing something like a puppy at a rabbit hole.

Behind the desk, he put the chair down firmly and stepped back, looking at it calculatingly.

Like any well-worn piece of furniture, his chair had a rich aroma of polish. But, sniff as hard as he would, the aroma had vanished. There was just no special sort of smell attached to the chair.

Deciding that another drink was called for, Carpenter pulled out the whisky bottle and then stopped, muttered angrily under his breath, and thrust the bottle back. Damn

these committee men. If they thought he was drinking too heavily, all hell would pop.

He looked again at the chair.

When he came into the office he could have sworn that the chair was behind the desk; but he hadn't really looked. It was one of those things that you take for granted. He couldn't be absolutely, one hundred per cent. sure that the chair had not been standing against the side wall all the time.

He could have come in, thinking the chair was where it should be, behind the desk—after all, he had been day-dreaming at the time, thinking about Katrin and the first experiments on Mars and the committee men, and then, when he went to sit down, he would have simply tumbled onto the floor.

Then his mind would have to think out some rational cause for the chair to be over by the wall and had fabricated the story that it had run there on its own legs.

*Like Katrin's doll?*

Seeing a chair running was *not* a rational explanation, and one which a normal mind would not think up. And, anyway, why should the chair be moved from his desk?

Carpenter grinned suddenly and kicked heavily at the chair.

It shifted backwards under the force and squeaked a little on the floor. He bent down and sniffed. No aroma. Straightening up, Carpenter knew that he was baffled. Either he was mad, or dreaming. Or—it had actually happened. But that was impossible.

A low murmur of voices came from outside and then a polite knock on the door. Of course, he had sent Louise off on some fool errand and now the committee men were here for the appointment and no one to receive them.

He cursed again and went swiftly to the door, brushing a hand through his thinning hair, opened the door and put on his professional smile of welcome.

That was part of the act of being a prominent scientist:

an act that he loathed and despised. But if you wanted to stay practising the science you loved you had to walk with your hat in your hand around the sacred halls of Congress. He would have no time now to think about water taps that sprayed him or chairs that scuttled like monstrous crabs, or even dolls that might or might not walk. Before him now lay an interview that had to be steered the way he wanted it. Any other thought was quite out of the question.

The electric clock said two minutes to eleven. God knew where the last hour had gone!

Carpenter knew the taller of the two men standing a little uncertainly at his office door, obviously wondering what sort of reception was this. He smiled again and said: "Good morning, Senator Merrick. Good to see you again. Come on in: my secretary's just gone over to the nurseries. Sorry you were kept waiting."

"That's all right, Doctor Carpenter," Merrick said, gruffly, and they all went into



the office. Carpenter waved the other two to chairs; then, with a set, fixed smile sat down himself in his own chair.

Whatever he had expected to happen had not occurred, and he had a flash of sardonic anger at himself. Sitting in his own office chair giving him the screaming heebie-jeebies was a situation too nearly approaching insanity for his liking. He had to do a lot of fancy talking just now and he couldn't be put off by other considerations.

Merrick was tall and dark and beefy, with the faint stubble of a hasty shave still peppering his skin. He reminded Carpenter of a hoary forest giant, against whose rough bark you could scrape tender skin until you were tired. There was an ominous glint in his pale eyes that Carpenter avoided. He shuffled papers on his desk and made a steeple of his hands, looked directly at Merrick.

There was a silence. Carpenter hoped that this little hiatus would not be construed

by the two visiting committee men as a hesitation on his part. He coughed and held all his body rigid until the spasm had passed.

"Still troubled, Doctor?" Merrick asked, sympathetically. "You ought to get treatment. Not too late yet."

"Maybe I will when my work here is finished."

"Well, don't leave it too long." Merrick took a thick cigar with a gaudy band from his pocket and cut off the end with a silver knife. He looked up suddenly, and said: "Oh, sorry. You don't know Senator William Mackenzie. Doctor Carpenter, Senator Mackenzie."

Carpenter grunted an acknowledgment, waiting for this farce to finish and the real business to begin. He had a good idea what these two men wanted to say. It remained to find out just how they proposed going about it. Mackenzie pulled out a silver cigarette-case and proffered it to Carpenter.

"I don't smoke, thanks, Senator."

"Mind if I do?"

"Not at all. I'll just step up the exhaust fans a little. Have to be careful, you know."

"Oh? What's your trouble?"

Merrick answered for him, round his thick cigar.

"T.B."

"I'm sorry, Doctor. Terrible thing, terrible."

"Well," Carpenter said.

"Well. How's things on Earth?"

"So-so. Government concerned about the budget again."

"They always are."

"We'll be frank, Doctor. The Government are seriously wondering whether or not they made—shall we say a miscalculation?—when they decided to permit you to go ahead with your Eugenics Research Station here on Mars." Merrick's thick cigar bobbed with every word. "I was one of those who considered that you had a wonderful idea there, wonderful. Just the thing Earth needed for the planets."

Carpenter said: "You considered? You mean, you've changed your mind?"

"That's for you to decide for me, Doctor."

"I don't quite follow——?"

Mackenzie broke in, his thin, sallow face with its glittering eyes reminding Carpenter of a rock lizard.

"The point is, Doctor, we doubt the efficacy of the results of your work."

"You doubt my work now! After ten years!"

"Please, Doctor." Mackenzie held up one thin, blue-veined hand. "I didn't say we doubt your work. Far from it. What we do doubt is the value of that work as applied to the needs of the solar system."

Carpenter knew that he mustn't lose his temper. Not with these men. His first analysis of their relative importance looked to have been fallacious. Merrick, for all his thick, blustering toughness, was not, apparently, so astute or powerful an enemy as Mackenzie. The devil of it was that Mackenzie obviously con-

sidered he was doing the right thing by the taxpayers back on Earth.

"As I see it," he said, slowly, reaching out and fingering the paper knife, "Earth began to reach out to the planets. We found Mars to be a world of red dust, uninhabitable by men; but still with a planet-wide culture to unravel and the strong possibility of planting a colony that could, in time, be self-supporting. On Venus there are conditions which are almost precisely the opposite. There are minerals, vegetable oils, foods, for the taking. All that is needed is a strong colonial civilisation to be built up to work in an integrated fashion with Earth."

"Yes," Mackenzie said, softly. "Go on, Doctor."

Cheese and the mouse, Carpenter said viciously to himself. Mackenzie was hoping that Carpenter would dig his own grave. To hell with the man! Carpenter began to decide that he didn't like Mackenzie.

"So there was something

needed," he went on methodically. "The planets had certain things which were needed on Earth. Men had to live on Mars and Venus, and eventually, I suppose, on the outer planets' satellites as well. So the answer, as I saw it, was to adapt man so that he would find life easier on his various new homes. Not, you'll notice, to adapt man so that he could live easily and naturally. There is a strong doubt that we could develop a strain of *homo-sapiens* suitable for life on Mars. Atmosphere is almost non-existent. We may well do so on Venus, however."

"Yes, yes." Merrick tumbled ash from his cigar. "I know all that, Doctor. The point is, the Government feel that we will make as good progress with ordinary people now. We can't wait twenty years or so until a crop of your mutated youngsters have grown up."

"Why?"

"Well. That is, Government secrecy and all that. I can't tell you. And that's flat."

"Surely, if you intend to

close down the Station, I'm entitled to a full explanation?"

"We said nothing about closing it down." Mackenzie's voice was soft. Soft and deadly.

"It is my confirmed opinion," Carpenter said, crisply, "that the work here is vital to Earth. I happen to know the work going on into interstellar drives——"

"Well, I'd advise you to forget it!" Mackenzie took his cigarette out of his mouth and looked at it, then put it back. "Forget all about interstellar drives, Doctor Carpenter! It's not healthy."

Carpenter swivelled in his chair, only half conscious of what that chair had just done, and stared for a space out of the polarised window in the dome.

Mars was level and flat, and red. Right away on the horizon the long wall of a massif shoved upwards and there were even a few bedraggled clouds wisping over the cliffs. But all else was ochre sand and dust.

He sighed. Government

security had been helpful up to a point when he had begun his experiments. He recalled the way they had provided the sixteen volunteers with no questions asked. Eight young men and eight young women. Fine, straight and the best of Earth's billions.

They had allowed their genes to be bombarded by his patchwork of equipment, the X-ray machines and the incredibly expensive cosmotron which provided him with V particles. They had willingly been made into breeders of guinea-pigs and he had been more proud of them, perhaps, than of his own accomplishment. It had been simple, after that, to ensure that they would have four boys and four girls. Chopping off the X chromosome had been the least of his worries. And he had done it. That had been the fire that ate into his mind as the fever ate into his lungs. He had done it!

He had artificially induced a successful, viable mutation with every chance of prolonga-

tion and heredity value. Of course, the full effects would come in the grandchildren; that was to be the next great step forward in research. What remained now, what he was expecting to be allowed to do after the meeting in a month's time, was the wholesale irradiation of volunteers to form a hard core, a nucleus of colonists for Mars.

After that, his work on Venus forwarded by his success with Mars, other eugenicists would carry on, produce the first colonists for the misty, damp planet. He would show the way—a sort of elder statesman, a doyen—the prospect of the future was dazzling in its possibilities.

And now the Government were stepping in with a flat no. And no appeals. He became aware that Merrick was speaking.

"Look, Doctor. We know you're ill. You've been working under far too much of a strain. You'll crack up, have a nervous breakdown. Can't you see it?"

"I can carry on with my work as long as is necessary," Carpenter said, stiffly.

"The Government is prepared to have this matter fully thrashed out at the meeting in a month's time." Merrick twisted his cigar round in his wet mouth. "But we're here to put a proposition before you."

"Yes?"

"It's this. Leave your work here at the point at which it has arrived. Retire. Have a good time. Enjoy yourself. See a doctor about that T.B. Later on, when the time is ripe, the Government of Earth will take up your work again."

"Waste ten years of my life? No, twenty. D'you think I should throw all that away now? What d'you think all this is about? Am I just an old shoe that you don't want and so toss aside?"

"We were rather hoping you wouldn't take it like that, Doctor." Mackenzie's hooded eyes and sallow face brought home that likeness to a rock lizard with force to Carpenter.

He shivered. He opened his

mouth, ready with a torrent of angry, bitter words. His mouth hung open and his white face went a shade of dirty grey.

Over the shoulders of his two visitors he could see the filing cabinet. Its doors were sliding noiselessly open and files were being lifted out. The cardboard containers hung suspended in mid air. Then a shower of papers cascaded from them, spread like fluttering autumn leaves over the floor.

He couldn't say a thing. Merrick and Mackenzie were looking at him with growing wonder spreading over their faces. Merrick took his cigar out of his thick mouth.

"What is the matter, Doctor? Are you ill?"

"No," Carpenter croaked. He laid his hands flat on his desk and pushed his chair back. "No. I'm perfectly all right." That was what he had said to Louise. What would she say if she came in and saw her meticulously arranged files scattered all over the floor? He began to giggle uncontrollably.

"Doctor Carpenter! I demand to know what is the matter!" That was Mackenzie. Carpenter knew in a flash of insight that the sallow little man was scared of anything he could not at once docket and file in the right portion of his brain for reference. The room was very hot.

Carpenter rose without answering and walked round his desk. As he reached the two men sitting tensed in their chairs the papers scattered on the floor whirled into the air, collected themselves into neat batches, secreted themselves into their cardboard files and popped back into the cabinet drawers.

The drawers slid back with soft metallic clicks.

"Did you hear that?" Carpenter demanded.

"Hear what?" Merrick's face held a frozen horror, as though he were in the presence of a madman.

"Why——" began Carpenter, and then stopped as the three sharp raps came on the office door. He relaxed. His

body sagged and he caught at the back of Mackenzie's chair for support.

He called: "Come in, Louise."

She came into the room; hesitated when she saw the two men seated in the chairs. They both rose, Merrick with a wheezing grunt; and Carpenter said: "My secretary, Miss Sherwood."

"I'm sorry, Doctor," Louise said, her eyes searching Carpenter's face with a frantic plea that he might tell her what had happened to him. "I did not realise that your visitors had arrived. There is a gentleman to see you."

"Well, I can't see him right now." Carpenter made his way back to his desk, keeping his eyes fixed on the filing cabinet. "Who is he?"

"He wouldn't give a name. Shall I tell him to wait?"

"No. That is—I shall probably be some time. He can wait if he wants to. Oh, and Louise."

"Yes, doctor?"

"Come back in here, will

you? And bring your note book.

When the door had closed behind Louise, Merrick demanded suddenly: "What's the idea of having your secretary taking notes, Doctor Carpenter? I don't like the idea of that."

"I want her to take a letter to Charrington." Carpenter spoke wearily, his eyes continually flicking to the filing cabinet which now stood stark and imperturbable against the wall. He must be losing his mind. There could be no other logical explanation.

"Letter? What for?" Mackenzie's lips were a slit in his face.

"I wish to confirm the arrangements for the meeting next month and assure the investigation committee that my work will continue as long as they wish. As long, that is, as the Government will pay for it."

"So that is your answer?" Merrick said.

"It is."

"There doesn't seem much

more to be said, does there? All I can say now, as a member of the investigation committee headed by Senator Charrington, is that when the meeting is convened I shall most certainly put in a report of your strange behaviour."

"You're at liberty to do that, of course. All I can say in reply," Carpenter was shouting now, "is that I passionately believe in my work here. Earth needs the new type of humans that my process will produce. They are fine, strong, tough types. They will be the men of the future, able to run their worlds efficiently and . . . and . . ."

He broke off with a sob and a fit of coughing shook him. So that was it!

"So that's why the Government are trying to stop the work!" he managed to gasp out, his eyes streaming with tears, the fever spots burning brilliantly in his sunken cheeks. "So that's it! They fear—you fear—that I'm creating a superman!"

"Really, Doctor Carpenter.

We are not prepared to discuss the matter with you. You're obviously a sick man."

"That's it!" Carpenter sobbed, gagging, trying to draw enough air into his decaying lungs. "And put those confounded cigars and cigarettes out! Are you trying to murder me?"

The two committee men came to their feet, outraged expressions on their faces.

"Good day, Doctor Carpenter. You'll see us at the meeting."

"Good day, gentlemen. I'll be looking forward to it."

The door did not have time to close before Louise had pushed it open again, her face white, and grey eyes alight with sympathy.

"What is it, Doctor? Here, sit down. I'll fetch some water."

"No! Don't go in there." Carpenter struggled over to the door of the washroom and stood doubled up before it, whooping great coughing bursts of agony. "Don't—



don't go in. In the drawer. Whisky."

Deftly Louise poured a half measure of whisky and Carpenter managed to drink most of it down. The fiery liquid seared some of the agony away, lubricated his throat. He gasped and wheezed and wiped his eyes with a paper handkerchief.

"Sorry, Louise. Causing you all this worry. I'm really all right. Those morons puffing smoke all over the place—no consideration at all."

Louise tossed her head. "That sort. I wonder what they'd have said if they'd been in your position?"

"It doesn't matter."

"Well——" She stopped as the buzz from the 'phone pierced through Carpenter's snufflings.

"Yes. This is Doctor Carpenter's office. His secretary speaking. Oh, yes? Doctor Hamlin. Yes. Just the very man. Now, listen, Doctor, don't take any notice of what Doctor Carpenter might say

to you. You should see him right away——"

And then Carpenter had taken the 'phone from her with a firm strength. He said: "Women! You ought to be ashamed. Taking advantage of me like that." He spoke into the 'phone. "Jack. Don't take any notice of what Louise says. I'm all right—couple of congressmen in here puffing at cigars. Yes, yes. I'm all right." He paused, then: "You think so?"

He glared ferociously at Louise.

"Well—if you think so. It's not time for a check-up yet. Don't sound right? Now, look here, Jack, you can't tell from my voice over the 'phone. No. Of course I'm not questioning your capabilities as a doctor. All right then. No. I'll come over to you. Sure. 'Bye."

He hung up and stared at Louise.

"I'll order the coptercar," she said, sweetly.

"I'm not going right away." He coughed. "There's this business of Katrin. I'm not

satisfied. You said something about a broken toy?"

"That's right. Katrin said that her doll was broken."

"Nothing about it walking?"

"Oh, that. You know what children are. Especially our eight new ones here. She just likes to dramatise. Building up a fairy story. Apparently the doll was really broken after she said she saw it walking." Louise looked down at the floor and then tut-tutted and picked up the butt of Merrick's cigar. She ground it out against the dispenser chute and dropped it down with a gesture of distaste. There were no ash-trays in the office.

"All this ash over the floor. Disgusting."

"Do you think Katrin saw the doll walking, Louise?"

"Why, of course not! You know children."

Sure he knew children. He knew kids inside out. What made them tick, their littlest aches and pains. He knew them all. The agony was that not one was *his*. There was

Louise—but how could he, a T.B. broken wreck . . .

Why, any minute now, the fumigation squad would be around to make sure that everywhere Doctor Carpenter went was very thoroughly decontaminated. Otherwise, they'd all get T.B. And it was so damned easy. Just like he'd caught it. Lots of worry, loads of responsibilities, overwork, and the latent germ reared its ugly head and—bingo—you were without half your lungs.

It wasn't really like that, he supposed, bitterly. If he'd had a little more care, checked up sooner—the hell with it. Regrets got you nowhere.

"I forgot, Doctor. All this excitement." Louise stumbled over the word as though ashamed to utter a stronger one that would embarrass Carpenter. "That gentleman to see you is still waiting."

"Oh, Lord! You've no idea what he wants?"

"He wouldn't tell me a thing. Wouldn't even give me his name. But he came up on

the same ship that brought your two other visitors."

"Oh, well, a man doesn't spend that sort of money from his own pocket without good reason. Show him in, will you, Louise?"

"Tidy yourself up first, Doctor. And put that whisky bottle away."

"Sure. Sure. Little Miss Perfection."

Carpenter looked up abruptly and caught the hurt, sick look of an unjustly chastised child on Louise's face. His heart gave a lurch. Goddam him! What sort of clumsy brute was he turning into?

"Louise! I'm sorry. I didn't mean—that is—things I can't explain have been happening and—oh, never mind. I'm sorry."

"That's all right, Doctor."

She went out the door and Carpenter put the whisky bottle obediently into the drawer. The filing cabinet stood dark and ominous in the edge of his vision. Beneath him, as he sat down, the chair

was hard and warm. Louise came back, grinned at him and made a grimace.

"He's gone. Couldn't wait, I suppose. Just as well. Now I'll call the coptercar."

"Hold on," Carpenter said carefully, anxious not to say the wrong thing. "I think I'll take a walk over to Armstrong at the Nursery. I'm still concerned about Katrin. Perhaps you'd care to come along?"

The Carpenter Eugenics Research Station was a rambling collection of transparent distended domes, huddled round the small, central balloon of Laboratory Number One. Off to one side the cleared area where the coptercars operated was the only other man-made thing in all the wide red sweep of land that stretched out blankly on all sides. Just gritty, choking ochre sand and dust in all this world.

A flurry of that sand blossomed under the vanes of a coptercar and the vehicle rose into the thin air. The rockets coughed smoke and flame,

and then spat the car away to the horizon like a pea from a peashooter.

"That'll be your two gentleman friends going back to Carson City and their sleek rocket to Earth." Louise's voice held all the contempt of a Martian colonist for those who came out to Mars as though it were but a step further to Inferno. "Can't see any sign of another car, or rocket. That's queer."

"What's queer?" asked Carpenter, his thoughts revolving around what reception he might expect when he attended the investigation committee meeting after what Merrick and Mackenzie would have to say.

"Why, the gentleman who wanted to see you. He's queer—no ship out there he could have come in if he'd shipped in from Carson City. And he couldn't have taken off before those other two."

"Oh, forget it, Louise. He's probably wandering around killing time waiting for me. Security will take care of him

if he pokes in anywhere he's not wanted."

They had reached the Nursery by now and Carpenter bent to look through the observation window at Katrin. He let out a chuckle of relief.

"Look at the little imp. She's got all the clothes off her doll and is dressing up the teddy bear. Quite a change of affection there." Carpenter tensed. "Was that the doll that was broken?" he asked Louise.

He made room for Louise to look through the window beside him.

"Yes. Yes, that's the one. She's just tossed it aside as though it were a banana skin. And that's strange. Little girls don't just throw away their dolls when they're broken. I know."

"Can you get it out without a scene?"

"Oh, sure. Katrin's always been fond of me."

Whilst Louise was walking round to enter the Nursery past the ever-vigilant armed guard, Carpenter let his thoughts roam idly over the

events of this chaotic morning. Tossed aside like an empty banana skin. That's just what Earth's Government wanted to do to him. Louise came back, smiling, the doll a pitiful, naked bundle in her hands. Carpenter noticed the way Louise held the broken doll, as if it were a newborn baby.

He took it and looked at it, not really expecting to find anything from a cursory inspection, his fingers warm on the plastic. His thumb caressed the head, relishing the satisfactory feeling his sensory nerves transmitted to his brain.

"See Armstrong?" he asked, casually.

"No. He wasn't in the Nursery. Shall I ask the guard if he's been around lately?"

"No. Don't bother." Quite obviously, Carpenter could never go into the Nursery. Not, that is, unless he had his head swathed in layers of filters and disinfectants. He preferred to let others go in for him. Unless it was absolutely necessary. Maybe, the prospect brought only a faint

uncase; maybe it would be necessary very soon.

"Call the coptercar, Louise. I'll see Jack, and I'll take this doll with me."

Doctor Jack Hamlin's dome lay just under a hundred miles away, a few minutes rocket flight from the Research Centre. Carpenter lay back in the padded chair behind the capable back of his pilot and tried not to think too hard about what had happened to him this morning.

The whole thing, everything so far, was too fantastic. It just didn't add up. The only answer that made any sense at all was the very answer that he would not, on any condition, allow room for in his mind. If he were insane, now, that would explain it all.

He coughed and lay back, his fever-sharpened eyes glittering on the vast spread of redness speeding past below. He just was not insane. It was something that he just did not have to think about twice.

That meant, therefore, that there was a rational explana-

tion for everything that had happened. Perhaps the filing cabinet was the most easily explained.

Telekinesis.

You could will a filing cabinet drawer to open, force the files to disgorge their papers onto the floor and then, still using the so far uncharted brain-waves, pick the papers up and return them to the cabinet. Oh, yes, it could be done. In theory. Carpenter knew of no single man on Earth who could do it, though.

The idea that it might be the children he had half-created, that in fact he had made a superman, flitted through his thoughts. That was certainly a lead that could not be ignored. It was not impossible. Only improbable. After all, he had been the man who had designed the equipment that had mutated the children's parent's genes. And he had worked for physical capabilities that would stand up to life on Mars as lived in domes and caverns.

There was not much chance

that he might have created a superbeing. Nor did he fancy himself in the role of a Frankenstein. The car slanted down to the apron before Doctor Hamlin's dome and Carpenter climbed out and into the entrance tunnel.

"Come on in, Carpenter. From what you and Louise said between you I gather it's the usual tug-of-war between your desire to work and your knowledge that you've got to take it easy."

"Something like that, Jack. God, I'm tired."

Everybody called Doctor Hamlin Jack. He was short and fat, and balding, with a cheery perspiration-soaked smile on his chubby face. His eyes were like two gimlets that could strip your last secret bare before you had time to blink.

"Tired, Doctor? This time of the morning?"

Carpenter glanced at the electriclock on the wall of Hamlin's study as he came out of the entrance tunnel. Hamlin didn't believe in wasting space.

"It's a quarter to one. And I've had enough today to last me a week."

"Oh?"

"Sure. Those two guys from Earth," Carpenter said, suddenly wary. He couldn't say too much, not even to Doc. Hamlin. After all, if he was to be certified, then this was the very man who would sign the documents.

The other man, who had been sitting lazily in a cane-bottomed chair, rose and came towards them. His wide lips and mobile smile matched the firm grip of his brown hand.

"Doctor Carpenter, this is Doctor Wheeker. He's——"

"I know." Carpenter smiled and took the drink Wheeker proffered. "Thanks. I've just been warned in the most solemn terms to forget all about interstellar travel. It's not healthy, so I'm told."

Wheeker laughed, his voice the first rich true sound Carpenter had heard all that miserable day. He said: "I know about your work, Doctor Carpenter. As it dovetails

into mine, I see no reason why you, of all people, shouldn't know about my project. I know that Jack here has told me of your experiments, so I guess he's told you about mine."

"Casually. I know that it won't be long before we are hitting the trail to the stars, as they say." Carpenter wondered what was the matter with himself. He was never so cynical about the dream of mankind, the vision of reaching the stars. After all, even though his own work might be curtailed, Wheeker's would go on successfully.

Wheeker looked at him then raised his glass. "Here's to the stars, Carpenter."

"The stars." He said it, meaning every word. Let this guy shoot his ships to the stars. The fact that the crews wouldn't be men descended from those experiments originated in the Carpenter Eugenics Research Station shouldn't mean a single damn thing.

Only it did. And it hurt. It hurt like the devil.

"I suppose you've come over for lunch, Carpenter," Hamlin said, his casual voice bringing back the atmosphere of normality that had gone with Carpenter's sharp remark. "Well, you're lucky. I've laid on something extra special in honour of Doctor Wheeler."

"Good. Come to think of it I'm ravenous." Carpenter remembered suddenly the reason he had come over to see Hamlin and his face clouded. Talk of lunch was all very nice and reassuring; but he was really here because half his lungs were missing. And he'd left Katrin's doll in the coptercar. He wondered why he thought it important.

During lunch, which to his surprise Carpenter thoroughly enjoyed, they discussed in a desultory fashion the latest scandals on Mars. It didn't take long. Carpenter was thankful that X-ray photography these days didn't mean no breakfast and the drinking of strange coloured fluids. He wondered why Wheeler had

come over to see Hamlin. The guy looked tough and well enough, but you could never tell. He was speaking now, and Carpenter sat up at the words.

"There's always been one little point about your experiments, Carpenter, that has me worried. Hope you don't mind talking shop like this."

"Not at all. Please carry on."

"Well, it's simply this. You propose, as part of the colonisation of Mars, to produce by artificially induced mutations people more suitably adapted for life on this chunk of red dust. Well, that's all right. That's fine. But how can you be sure that this system won't turn into an autocracy? How can you be sure you don't create a race of super-beings who will control the rest of us poor mortals?"

"Oh, come now, Wheeler, really——"

"Yes, Carpenter," Hamlin broke in, looking curiously at the nervous twitching that Carpenter had been vainly trying to prevent his eyelids performing. "It's no use get-



ting all indignant. This is a problem of your work, and——”

“The whole basis is physical!” Carpenter’s face, with its two spots of red, was filled with strain at the knowledge that he must get this idea over right. “There is absolutely no tampering with the mental side of a person’s make-up. In the case of the Mars children, for instance, I’m giving greater lung capacity and a filter system in the nostrils that will more easily be able to cope with this damned dust and sand. But it’s still all based on human stock, still a human being however some factors are altered. To make a super-being as you suggest, Whecker, would require definite applications of my experimental work to the mental areas—and, believe me, I’ve left those severely alone.”

“Why?” was all that Whecker said.

“Why? Well, perhaps there is some idea that human flesh may with impunity be altered, changed, adapted, what you

will. But a person’s mind. No. That’s something else again. I’ve left the mental areas alone, I suppose, because I don’t have the necessary qualifications to make changes there.”

“You’re arguing now from a metaphysical standpoint.”

“Maybe. I feel that the world is in a pretty bad shape, as it is. Even the work put into reaching the planets, the attempts at colonising them, has not been enough of an outlet, a safety valve, for people’s emotions.”

“But the world is governed by a World State. Ergo, no more wars. Isn’t that what you had in mind?”

Carpenter swilled his coffee forgetfully. How could he get over to these men the ideas that had fomented inside him the past twenty years? They were practical, severe men of science. One a doctor. The other, a designer—the first designer of interstellar spaceships.

“What I had in mind,” he said, slowly, at last, “was simply that mankind has been

getting along pretty well over the past couple of hundred years. Once we'd got around to a culture that accepted planetary colonisation, the war concept faded. But there's still some more—call it steam, war-fever, lust for conquest—there to come out. God help anybody living on the outer satellites if Man bumps into them."

"But they're empty of life——"

"I know, I know," Carpenter said, brusquely. "I only meant that if there did happen to be anybody else in our solar system I'd feel mighty sorry for them by the time the folks from Earth were through with them."

"Well, surely, Carpenter," Doctor Hamlin said, "feeling like that, why shouldn't you go ahead and eradicate with your system of eugenic control all the war-fever inherent in man? You could do it, I suppose?"

"Could I? I suppose so. The question is, should I? What right have I got to take away

from mankind the power that enabled him to dig a pit for a mammoth, light a fire in a cave and keep himself and his mates alive through the tail-end of the glacial period?"

Hamlin finished his coffee, pulled out a battered pipe, looked across at Carpenter, grunted mournfully, and put the pipe back. His deep-set eyes twinkled in the chubby face.

"I think you're right," Hamlin said, rising from the table. "Don't take away mankind's guts." He gestured to the far door. "I'm all ready when you are, Carpenter."

Going into the room behind the confident back of Hamlin, Carpenter had a doubt creep into his consciousness. "Aren't digging pits for mammoths and lighting fires in caves a little dated? Antiquated? No longer necessary?"

He shrugged and began to take off his collar and tie. Let all that ride for now, anyway. What was more important was what Hamlin was going to see in his infernal machine.

Wheeker came to the door, his coffee cup in one hand, a serious, sympathetic look on his brown face.

"Luck, Carpenter," he called and shut the door.

Hamlin fussed with his machine, then waved Carpenter into position against the screen. The room lights went out under Hamlin's touch and the green flicker of the X-ray screen painted outlines in the room with second-hand St. Elmo's fire. Carpenter shut his eyes.

Minutes later the green light faded and the room lamps came back on.

"You can put your tiepin back on, Carpenter. Oh—and you didn't take out your back collar stud."

"Sorry, Jack. Guess I wasn't thinking."

"You mean you were thinking of something else. Well. Here's the plate. I've seen all I wanted to see through the direct vision screen. The plate's for the record. And you—if you're interested."

Carpenter kept his mind

like a still, placid mill-pool, calm and unruffled. He took the plate and looked at it. A stone dropped into the mill-pool, a thundering avalanche of rocks that sent his mind reeling under the blow.

"This—this." Carpenter untied his tongue and tried again. "I know what to look for, of course, but this—I mean. What's your opinion, doc? You can give a better judgment than I."

Hamlin drew his brows down and looked slantwise at the silent machine. He said, explosively: "What does it mean? You damned fool, you know well enough what it means! If you don't let me give you proper hospital treatment instead of coming over for a 'check-up' whenever you can spare the time, then you'd better get out your hammer and chisel and carve your epitaph."

"As bad as that? I thought so." Carpenter knew why Hamlin had phrased his diagnosis in just those words. Sentiment would have been

an off-key note, here, in the domed, sand-blasted home of a Martian G.P.

"Listen, Carpenter. I like you, see? I don't want you to be put down a shallow scraped hole in that ruddy sand out there. So give your work a rest and come into the sanatorium at Carson City. You'll have to have a resection, of course, but——"

"I can't rest!" Carpenter had his collar and tie back on and now went awkwardly to the door, his legs feeling as though someone had just beaten them with a lathi. "In a month's time I face a Congressional Investigation Committee and fight to continue my work. Already they've been at me to pack it in, cease the project, retire. My God! *What do you think would happen to the children?*"

Hamlin just mumbled something.

"I've fought too hard for this thing, all along, to finish now." Carpenter went out the door and Hamlin closed it behind them. Wheeler rose

from a chair as they entered, his wide mouth firmed down over a pipe. He quickly removed it and knocked it out in the ash tray.

Carpenter clicked his tongue in annoyance.

"I left my tie-pin by the machine, after all," he said, wryly. "Sorry, Jack, guess I'm not concentrating very well."

He went towards the door leading off into the darkened room where the X-ray machine humped like a primeval monster of the swamps. From the shadows in the room, as the widening wedge of light splashed yellow across them, came a scrabbling, furtive scutter of sound. Carpenter paused, tense, one hand on the switch. All was silent, now, yet, when he had entered, there had been a noise . . .

He flicked the lights on.

His gaze roved the room, sorting, cataloguing, trying to find, primarily, just why he should be acting like this. Were even the soft sounds of mice, say, to frighten him now? Was his nerve that

badly shot? He grunted in disgust at himself and bent towards the machine, picked up his tie-pin.

His fingers were trembling when he thrust the pin into his tie; he pricked the skin of his chest and cursed half-heartedly. His eyes were scanning every inch of the room, jumping from equipment and medical supplies to the draped curtains over the low window. From the number of times he had been here before, the room to his memory looked all right. Anyway, why shouldn't it? He recalled that creeping slither of noise and frowned. Then he turned towards the door, adjusting his tie with a defiant jerk. The hell with it! Just nerves.

In the last second before he flicked the light off and went through the doorway, he glanced back over his shoulder. The room was quiet and still, and, oddly—waiting.

Inside Hamlin's study, which was also his dining room and occasionally his bedroom, the doctor and the

physicist were deep in the discussion of relative values of anti-biotics for possible extra-terrestrial use. Carpenter dropped his body into a chair and stuck his legs out stiffly before him. He needed something to soothe his ruffled nerves and such a discussion might be the very thing. Following on the tail of one of Hamlin's remarks, he said: "I'd noticed you might be increasingly interested in micro-organisms, Jack, from the other electron microscope you've installed in there."

Hamlin looked up quickly, his chubby face apologetic. "I've installed no new electron microscope, Carpenter." He laughed, a forced, strained sound. "Can't afford that sort of double luxury."

"But I saw it, in there, not a moment ago."

"You couldn't have."

"I tell you I did!" Carpenter rose to his feet, unwilling to let this thing pass, yet afraid to pursue it too far for fear of what he would find. He went towards the door.

"I'll soon prove that, Carpenter," Hamlin said, and, followed by Wheeler, went into the rear room.

"There you are, Jack," Carpenter said, without looking into the room. "Now what do you say?"

"I don't get you at all. There's only my old electron microscope there."

Carpenter looked. One machine only. About as tall as a man, and as bulky, there was no chance that he could overlook it. Nor was there a chance that he hadn't seen two when he was last in here.

*What was being done to him?*

They all went back to the study and Hamlin poured drinks all round. Carpenter needed his. Wheeler sat for a moment, fondling his glass, and staring broodingly before him. Then he glanced up and said: "You really thought you saw two microscopes in there, Carpenter?"

"I thought I did. But, of course, I couldn't have, could I?"

"No. You couldn't have."

Wheeler finished his drink. "I'll have to be pushing along now, Jack. Thanks for the lunch. You'll let me have your report as soon as you can? I want to know just where I stand when it comes time for the first volunteers to start for the stars."

"I'll let you know." Hamlin bustled about, seeing Wheeler off in his coptercar. Carpenter sat hunched moodily before the fire, and it was not until Hamlin came back into the room that he realised that he had been alone. He shivered.

Doctor Hamlin walked into the room, stood looking at Carpenter with a look that troubled him. He sat up, the glass falling from his hands.

Hamlin began to melt. His body changed and flowed, became an impossible, distorted caricature of a man. The chubby face was the last to twist and disappear like a waxen doll's head in the fire. Where Hamlin had been was a shapeless mass with four pseudopods thrusting against the floor. The thing swivelled

round and ran out the door by which it—as Hamlin—had entered.

Carpenter wasn't sick. He held onto himself and lay slackly in the chair, shuddering.

Doctor Hamlin walked into the room, stood looking at Carpenter—

"No!" Carpenter yelled, jumping to his feet. He caught the doctor's shoulders in his clenching fists, doubling up the cloth, and shook him wildly.

"Hold on, Carpenter!" Hamlin tugged himself free and pushed Carpenter's scrabbling hands away. "What's the matter?"

Carpenter took a deep breath. He said: "Nothing. Sorry, Jack. Stupid of me. Must have had a nightmare, sitting dozing in the chair. I think I'll be getting back to the station."

Whilst he had been speaking Hamlin had taken a tablet from a plastic box and dropped it into a glass of water. He held it out.

"Here, take this. Steady you a bit."

Carpenter drank without thought. Time enough for that later. Right now he felt like a sponge that has been wrung dry. When he had said his goodbyes to Hamlin and found his copter car just settling for him in response to the call, he still could not see any answers to the problems confronting him. His head ached.

All too soon now he would be back at the Eugenics Station, with all its attendant problems and decisions. And there was a tremendous amount of work on his plate for today that so far had not been touched. He had a month in which to prepare his case for the investigation committee and that case now was a totally different one from what it had been this time yesterday. Merrick and Mackenzie would see to that. He coughed, the red-hot needles of pain scraping up the back of his throat.

The domes of the station

whirled up, a solitary jewel in a waste of shifting red sand and gusting ochre dust storms. There would be a blow tonight.

Going through into his own office, he put the doll he had reclaimed from the coptercar onto his desk, pulled out his chair, thumped it, and sat down. He examined the doll with interest. A simple plastic job, similar to a million others spewed out from the Earth factories, it had none of the elegancies of super-perfect expensive dolls. The legs were detached from the body, hanging down on the ends of thin bands of plastic which, evidently, had once joined inside the pelvis to hold the legs in position. An idea struck Carpenter. He took out his knife and worried the end of one piece of plastic thread out. Then the other.

He joined the two pieces as they would have been joined inside the body. He sat and looked at the frayed and twisted threads at the junction for a long time.

*So Katrin had been right.*

Her doll *had* walked. The frayed ends of the threads holding the legs proved that. As each leg went backwards and forwards, in a manner certainly not intended in such a cheap, mass-produced article, they had worn the plastic through. There were even grooves on the legs where the pelvis holes had rubbed. A thin, dusty line of sweat lay across Carpenter's forehead.

As long as the phenomena which he could not explain had been occurring to him, there had always been lurking in the background the obvious solution that he was insane. But if these mysterious phenomena occurred to others—— But why little Katrin?

A knock on the door and Louise came in, calm and smiling at him. He tensed himself, waiting for her to melt and dissolve and change into something obscene.

"Aren't you pleased to see me?" she asked, pertly. "You look as pleased as a Senator with income tax problems."



"I'm all right," Carpenter grunted with more force than he intended. "Look at this doll, Louise. Could it have walked as Katrin said?" He pointed out the frayed ends and the conclusions he had reached. "Telekinesis could explain it."

"Yes—but——" Louise, he could see, was trying to understand why he should take such an outlandish position in this childish matter. "I see how the doll was broken. I expect Katrin did that herself, walking her doll, and when the legs broke she fabricated the other story." Louise sounded perfectly confident.

"Does that add up with Katrin's character?"

"Well—no. But these children are different from any others."

He ached to tell Louise of all that had happened. But now, after her appraisal of this particular problem, he felt that she would rationalise them all. And if the one particular event on which he was pinning his faith could

be proved to be merely a childish deception—what about all the others? Hallucinations? He coughed and spluttered and found the whisky bottle. Was he mad?

"I came in to tell you that the gentleman who was waiting for you is nowhere to be found. I've had the guards searching."

"Okay, Louise. I'll leave that to you and Security." His arm, putting the tumbler back, clumsily knocked a pen on the floor. He bent to retrieve it, and as his head went down on a level with the seat of his chair he caught the familiar odour of polish. He stayed down, sniffing.

On the plastic floor under the legs of the chair, where he shifted it around, were innumerable little scratches and contusions. At this angle, with the blood drumming in his ears, he could see four thin, wavering scratches leading away from the chair legs and disappearing under the wash-room door. He straightened up with a grunt and pulled his

tie straight. His face was flushed but the glitter in his eyes shone far more fiercely.

Crossing over to the wash-room, he remembered Louise and turned to see her looking wide-eyed at him, one hand to her mouth. He smiled reassuringly.

"Do you think I've been acting strangely today, Louise?"

"Strangely? Of course not—that is, well——"

"Okay, Louise." There was an inner excitement bubbling in him now. First Katrin's doll and now those four faint scratches. They were fragile things, but they were the proof he had needed. "Whatever you may have been thinking," he went on, calmly, "I am perfectly all right. I'd like you to go down to Security and borrow a gun for me, will you? Tell them any yarn you can think of why I should want one—but get me a gun. Okay?"

"I'll try, Doctor, but you know what Security are."

"I know. Still, see what you can do."

Before Louise had left the office, reluctant to leave him, Carpenter knew, he had pushed open the door to the wash-room and switched on the light.

He crossed directly to the tap.

Careful inspection showed him a slight burr on the heads of two screws holding the splashback, and a slight amount of dust in a distinct line on the floor beneath. The splashback, containing the soap rack and the water taps, had been bodily removed and then replaced. The line of dust still dark with moisture, had sifted down when the plastic plate had been shifted.

He turned back to the door and found the four scratches. They wheeled sharply at a right angle inside the wash-room and stopped beside the near wall.

So—someone had taken his chair out of the office. And someone had taken down the tap.

Why?

So that the tap that had

curled up like an elephant's trunk could be substituted. And so that the chair that had scuttled across the room like a crab could be put behind his desk.

To his amazement there was a tight grin across his face. He looked at himself in the mirror and was shocked at the gaunt death's head that glared back from hollow eyes. He *had* been going under the weather. But now it was different. Now he had a tangible something to fight against.

Whatever being, or thing, from whatever hell or heaven had been molesting him—he was aware at last of its activity.

And, one thing for sure—he wasn't going mad.

He began to tick items off on his fingers. The first two he had partially solved, here in the washroom. The filing cabinet and Katrin's doll could both be explained by telekinesis. That left the two electron microscopes and the "Doctor Hamlin" who had melted and flowed into some

shapeless mass of jelly with four stumpy legs.

Could it be that had he not gone back into the rear room to fetch his tie-pin some other phenomena would have occurred a little later? Something to do with the electron microscope? Faint ideas began to flutter into his mind like captive birds in a cage. He needed to think.

On an impulse he went through the office, closing all doors behind him, his senses keenly alert for anything unusual to occur. If he was right, then anything of the ordinary, domestic, natural things around him could at any second and without warning begin to perform in some completely impossible, fantastic manner.

Louise had not returned yet. No matter. Somehow he had the impression that guns wouldn't solve a thing. That had really been a simple way to ensure that Louise wasn't there when he inspected the washroom. Whatever conclusions he might

privately have arrived at, anybody else would consider him a perfect psycho.

Laboratory Number One was dark and sombre. To Carpenter it was almost a second home. He put on a few lights and began to warm up the cosmotron, fiddling with the input and chuckling sardonically to himself over what the techs down at the pile would be saying when the load came on. This baby really took the power. To accelerate protons so that they collided with the carbon target at around a cosmic meeting of some two thousand two hundred million electron-volts needed the sort of input that could only be fed by the piles, buried in their tiled vaults below the research station. This particular cosmotron had been only one of the many tools he had used in shaping the very cell structure of the eight children playing in their Nursery.

He had had to be careful. Too much dosage from the artificially produced cosmic

rays, endured at such short range, without the atmosphere layers to filter out the dangers, would have blasted and seared the volunteer parents. He swung the lensed aperture, dark and cold, and sighted it on the screen. So far, nothing unusual had happened.

When it did, he hoped that he would be ready.

He began to prow! round the laboratory, poking here and prodding there.

"Now where the blazes did I leave it?" he grumbled aloud for the benefit of any ears that might be listening.

*Ears.* What ears did he expect might be in this lonely laboratory? He didn't know. What he did know was that something—somebody—had substituted a water tap and a chair which did unnatural things for his own normal possessions. They had played tricks with a filing cabinet. They had almost been caught when he'd spotted the second microscope. They'd tried to turn his mind completely with

that hideous trick with Doctor Hamlin.

They were trying to drive him mad.

And he didn't like that. It made him fighting eager to meet up with them and put a dose of coruscating cosmic rays into whatever shape they were using at the time.

"Now where is that damned suitcase," he grumbled aloud again. He knew where it was, of course—in his bedroom higher in the dome. But if he found it down here . . .

Cosmic rays would blast it and he might never know what *its* own, normal shape was. But he wouldn't care. He had a vague realisation that he had passed beyond the bounds of normalcy in this affair. He was thinking about things that were verging on the fantastic with a calm acceptance of them that made his purpose seem clear. He was talking about a suitcase in his bedroom, *expecting* to find it down in the lab.

And, when he did see it, to

deluge it with killing Cosmic rays.

Perhaps he was insane, after all.

"If I don't find that confounded suitcase in a couple of minutes——" he began, holding on to the sure, dominating conviction that he was not insane. He couldn't afford to be, with all the responsibilities of the Carpenter Eugenic Research Station strung round his neck. He coughed and wiped his mouth with a paper handkerchief.

"Where's that suitcase?" he said aloud, annoyedly.

Nothing. Silence. The laboratory lying still and quiet and without that pulse beat denoting the presence of another entity. Oh, well, he'd have to try somewhere else, the office for instance, and bring the suitcase in here when he found it. If he did.

"I'm afraid you won't find the suitcase now, Doctor Carpenter," the voice behind him said softly.

He turned slowly to face the

door, eyes narrowing. "Why not?" he asked, inanely.

Isn't it obvious?" The man who answered was just a man, standing still in the half shadows of the room.

The impact of that hit Carpenter.

"Who are you?"

"Listen, Doctor Carpenter. I have come a long way to see you. Such a long way that even *my* mind boggles at the conception. Oh—and, yes, please don't use your rather clumsy cosmic-ray machine on me. It might not function quite as you intended."

"What sort of devil are you?"

"No devil, Doctor Carpenter. Please, let's be sensible over this. I have a proposition to put to you, one which I think you will agree you ought to accept."

"I've been propositioned already today," Carpenter said, doggedly. This was insane. A man, walking in here, knowing what was going on, just standing there, talking naturally to him . . . Dolls and

Files. Telekinesis. Telepathy, of course.

"That is correct, Doctor Carpenter. Although your mind is not completely clear to me, I am capable of following most of your thought processes."

"And I suppose you're the one who's been trying to send me mad? Yeah. I guess you are. Well, then, you'll know just what I think of you, won't you?"

"I'm afraid, Doctor Carpenter, that your judgment is fully justified. However, I can explain."

"Huh. I suppose the best thing is to call Security and turn you over to them."

"You can do that, of course, if you wish. I assure you they would not hold me for long. Listen to me, Carpenter," an edge came into the other's smooth voice, "and listen straight. You'll hear my proposition, what I have to say, and like it. I've come numberless light years and numberless years, too, to see you. So you'll listen."

The tone of the other rocked Carpenter. He took a short step backward, then turned on his heel and went through into the office. He picked up the phone and his mind was already forming the words to call Security when the phone lifted from his hand, gave itself a little jerk which snapped the cord, and settled itself back snugly into the cradle.

The stranger moved slowly into the office and stood staring at Carpenter.

"Telekinesis, huh?" Carpenter lifted the phone again with a swift, pantherish movement and threw it full at the stranger's head.

The handset curved in mid-air, like a frolicking butterfly, jittered, then catapaulted an inch past Carpenter's ear and crashed against the wall. Carpenter let his breath out in a whooshing sigh.

"That's to tell me I'm at your mercy, is it? Why, you crawling, stinking something! Why did you have to come here? You're trying to drive me mad. Why? For God's

sake, man, don't just stand there! Talk, damn you!"

"Calm yourself, Carpenter. And get one thing straight. I cannot kill you. So don't try to kill me."

"Calm myself? I've been thinking myself going insane and you say calm myself!" Carpenter doubled up then as the pain shot through his body. He was coughing and gasping and swallowing all together in a chaotic mixture of agony and mental confusion that tore his ravaged body with cruel fangs.

He choked and gagged and tears came from his eyes in the violence of his coughing. There were taut bars of steel pressing against the sides of his throat, pulsing outwards and tearing him with claws that would never cease until his lungs were completely gone.

Strangely came peace. He ceased coughing, and he could swallow in comfort. The pains disappeared and he brought his wracked body upright and stood more easily and naturally than he had done for years.

His eyes narrowed on the stranger.

"Yes, Doctor Carpenter. I could not bear to see you——"

"Thanks." Carpenter cut him off embarrassedly. "Thanks for that. I feel better than I have for years."

"We have a skill in these matters. That is part of my proposition."

Carpenter fetched out the whisky bottle and, with a dry chuckle, said: "All right, you needn't teleport this out of my hands. I'm not going to brain you with it."

He filled two glasses and handed one across with a lifted eyebrow. The stranger took it and sniffed appreciatively.

"I feel that we might get along a little better now." The stranger's flat voice held no discernible emotion; but Carpenter, with that magical ease in his chest, couldn't have cared less.

"After you've fixed me up like this, I suppose I ought, in all reason, to listen to what you have to say. But first—am

I right in thinking that you've been behind all the queer things that have been happening?" Mention of the unpredictable phenomena made Carpenter clutch his glass tighter and his nostrils flared. "And you'd better make it a good story, fellow. I didn't like being pushed around like that. Even though you have done something to my chest, I don't know but that I ought to turn you over to Security to work on."

"I thought we'd gone over all that, Doctor Carpenter. I've come a long way to do a job. It appears that the first approach has failed. We did not manage to prevent you from carrying on with your work here before you had discovered us."

"Discovered you? Who are you, anyway?"

"That is part of my story——" the stranger began; but Carpenter sat up in his chair and interrupted violently.

"Trying to stop me from carrying on? In heaven's



name, why? Why do you want to stop me?"

"If you'll let me tell you my story, you'll know." The other's voice was testy.

"All right, all right. But I tell you, you'd better make it good. I haven't worked for twenty years on this to pack it up the first time someone turns a little superscience on me."

"That I know. Briefly, then, I am a member of a civilisation existing thousands of years in your future. I have come back through——"

"You're a time-traveller. Yeah, I'd guessed that. Nothing wonderful about it, really. It had to happen one day. What I want to know is why pick on me?"

"My race live on a planet circling a sun called Molinar. We are free and independent. We have our own ways of life. I am one of the semi-privileged class of mystics, capable of many things that are, perforce, denied to others, and to you, Earthman."

"Is this form I see you in

your natural shape?" asked Carpenter, sipping his drink. He was deeply interested. The first time-traveller, coming from the far future, sitting here calmly telling him of the wonders that were to come. Only—why had they tried to drive him mad? Why was his cherished life's work to stop?

"Not quite, Carpenter. We are humanoid, but I have assumed this shape for obvious reasons."

"So you can change your shape? You are polymorphallactic." Carpenter stopped there and the thing clicked in his mind.

"*You were the tap and the chair!*"

"Precisely. I thought you had guessed already."

"I suppose I had, really, only my mind wouldn't accept it until it was shown in black and white without contradiction." Carpenter wiped his forehead. "Sitting on a chair that was really a man—no, of course not. You're not a man. You're a Molinarian."

"It comes to much the same

thing. I see that you have discovered how I removed the tap and splashback and changed my form to replace them. And how I put your chair in the washroom whilst I took its place behind your desk."

"That was a risk, wasn't it? I mean—I might have gone into the washroom and seen it."

"In your state I didn't think you would. And, if you had, well, you saw two electron microscopes that no one else did."

"Yes, yes." Carpenter breathed bitterly. "You had it all sewn up tight, hadn't you? A greased chute down to the madhouse. Well, get on with it—tell me why."

"Your work at the Carpenter Eugenic Research Station has to cease." The Molinarian held up his hand to check Carpenter's outburst. "Listen, Earthman. That term, Earthman, is hated and loathed where I come from. We may not kill, we Molinarians; it is part of our philosophy of life.

We have a gnosis that transcends anything known on Earth."

"So you don't kill. You just send people mad."

"I was not attempting to send you completely insane. You have too strong an inner core of mental strength for that. But if I could so derange your mind that you voluntarily decided to give up your work here——"

"Well you didn't. I think you'd better hurry up and tell me why." Carpenter's voice was dangerously soft; he knew, with an edge of panic, that it was near breaking point.

"At the time from which I come Earth has expanded from her own sun through many solar systems by use of the Wheeler Drive."

"So he made it, eh? Well, that's some comfort."

"Earthmen are also divided up into castes, or classes, or levels of function."

"So what? Folk are in classes today."

"Not quite like these. Earth-

men in the time from which I come are segregated into their Carpenter classes with utmost rigour."

Carpenter lowered his glass and looked with shocked disbelief at this strange visitor from the far future. He could be dreaming it all, he knew, but it was most unlikely. Carpenter classes?

"What the hell do you mean?"

"Simply that people of Earth and their conquered worlds are deliberately bred to fit into the social and economic pattern. To your eyes, Carpenter, they'd mostly look like a collection of freaks."

"My God!" Carpenter breathed. He could believe it, strange and impossible though it might seem. He knew, from his devious experiments into the very essence of cellular structure, what a curious, unpredictable, emotional creature man was. Yes, it was well within the scope of a man's imagination to breed his fel-

lows to fit into a socially ordered plan.

"You have the facts more or less correctly," the Molinarian said, bitterly. Carpenter knew he had been reading his mind; but, what the hell? What did anything matter now, if that was the way in which his work was to be distorted and twisted?

"You mean they use my process to irradiate parents, producing children to perform set jobs in the economic structure, instead of adaptations to suit fresh environments on the planets?"

"Yes. Some of the results are not pretty. I don't think I need to elaborate too much. You, of all men, should be able to visualise the sort of horror that could be produced if, say, you wanted a man to clean out a mile of drains."

*Eels.* The shocked thought burst in Carpenter's mind. He shuddered. "Assuming that what you say is true," he said, striving to keep his thoughts into an orderly groove, to prevent them from

spilling over and drawing up phantasms of hideousness from his imagination. "Say it *is* true. That leaves me with a few questions."

Eels. Carpenter rose from his chair and began pacing up and down the room, his hands locking behind his back. The fever spots still burnt on his cheeks.

"Why do you tell me this? Good God, man, it's thousands of years in the future. It's no concern of mine! I don't want to know!"

"But you started it all." The Molinarian's implacable words came flatly. "At your instigation man began to change his physical form, to breed sports and freaks on purpose."

"But you're polymorphallactic!" Carpenter cried hopelessly, as though that had a bearing on the case.

The Molinarian spread his hands, palm downwards, and said evenly: "That is nothing to do with a stable form deliberately changing itself,

and degrading some members——"

"But why tell me? I mean, why should you, a member of another race altogether, bother to tell me this? Why come back through time and try to stop my work? Is it because you are the guardian angels of Earth?"

There was nothing angelic about the almost animal hatred that came from the Molinarian then. His eyes sparked with a feral lust that drove Carpenter back against the table, one hand outstretched to support his shaking body.

"I am sorry, Carpenter. Almost, I contravened a basic then." The stranger chuckled shockingly. "Still, you should not be so flippant in such a position, Doctor. I'm afraid that out Molinarian sense of humour is slightly off-shade from Earthmen's."

"That's not unusual. Now tell me, why try to put me off my work?" Carpenter said shakily, gulping.

"The answer is simple. Earth has expanded far in the

time from which I come. Even now, whilst I speak to you, in the future Molinarians are going down before the weapons of Terra. Terran ships have swept all before them through the Galaxy, until they met up with the cluster owning friendly allegiance to Molinar."

"Then they got a fight—is that what you mean? And you want me to do what about it?"

"Terra did not get a fight," the Molinarian contradicted coldly, a sombre brooding chilling his listener. "You forget something, Carpenter."

"Forget? What?"

*"We may not kill."*

Carpenter sucked in his breath and his eyes narrowed. There was almost pity as he stared at his visitor from the future.

"You poor devils," he said, thinking back to what he had told Hamlin and Wheeker at lunch.

"I get it now," he went on, almost under his breath. "You're being conquered in

the good old Earth way, and you want to be left alone to live out your lives as you have planned them. And you've figured that it's because Earthmen are so well adjusted—adapted—in the future that if they were not so adapted they wouldn't be splitting space so fast and so easily. Of course, the varying classes would include soldiers and spacemen and folk who could take a planet apart atom by atom."

Carpenter's eyes clouded over at the prospect. The dazzling, glorious future of Earth among the stars? Was it so wonderful, after what the Molinarian had told him? It stank.

"And you've come back here, to me, and tried to get me to stop my work. First you tried sending me mad, so that I'd be stopped, anyway, at the committee meeting coming up. Then, when that failed, you spun me this sob story about how terrible it would be for men to be changed into freaks. Of course it would be terrible. But, really, why you want me

to stop my work is a basic, simple drive. You're losing a war."

The Molinarian didn't say anything. He sat in his chair, head sunk on his breast, looking up at Carpenter.

"Say something, man. Don't just sit there."

"What can he say, Doctor?" Louise said from over Carpenter's shoulder.

Carpenter relaxed. He said: "How much have you heard, Louise?"

"Enough to know what the score is. Why didn't you tell me?"

"Would you have believed? No, wait. It doesn't matter now. What we have to do—what I have to do—is try to chart some sort of course through all these shifting currents of emotion. God knows what to believe. I don't."

The Molinarian spoke softly. "Don't forget, Doctor, I can cure your T.B."

"You're bribing me?"

"No." The stranger shook his head in a curious, un-

earthly gesture. "Call it a reward if you will."

"Call it what you like, it's very tempting."

"You could, Doctor," Louise whispered.

"Listen, both of you," Carpenter said, heavily. "If I had my health again, if you cured me from this disease, stranger, I'd not be able to work, not be able to carry on my dream. That's it, isn't it?"

They were both watching him, scarcely breathing.

"Well—you're unlucky. My work comes first."

And as soon as he had said that, Carpenter was coughing and choking, gasping in the final convulsions of the fit that had attacked him when the Molinarian had halted it before. He stared out from red-rimmed eyes at the alien.

"You swine!" Carpenter dragged a shaking hand across his mouth and, again, abruptly he was free from the pain and the coughing and the retching agony.

"Forgive me, Doctor Carpenter," the alien said, un-

easily. "I find it very easy to slip into your Earthly ways of revenge and petty annoyance. My philosophy, the way of life of Molinar, should make me completely free of all pettiness and power lust, and greed. All the things, in fact, that disfigure the civilisation of Terra."

Carpenter poured himself another drink and gestured to Louise to be seated. He said: "You've got me rattled, fellow. How do I know you're speaking the truth? Molinar could be losing the war, all right. A war against normal Earth people, adapted for varying planetary conditions in the ways I visualise, but still people. Still Earth-like, changed only in the minor ways that will fit them for their new environments. Your story could all be a fabrication to stop my work, and give your people of the future a walk over Earth."

"I don't know——" Louise began.

"It is not so." The Molinarian's voice was low and hope-

less. "We know of the drives that actuate you of Earth because we have channelled them in our own system so that we have a synthesis of all the values that are labelled 'good.' The 'bad' characteristics have been weeded out. The terms 'good' and 'bad' are only relative, of course. We had always thought of our non-violence, our lack of the capacity to kill, as a 'good' facet. Now, with all Molinar being crushed by blood-hungry conquistadores, I'm not so sure."

"You mean that maybe if you could kill, and thus stave off your conquest by Earth, it wouldn't be a 'bad' thing?" Louise was sitting tensely on the edge of her chair.

"All that's very interesting, but has nothing to do with me, with us, here and now!" Carpenter burst out. "Can I believe you? Can I accept the fact that the future generations of man will do these things? I don't know!" He put his face in his hands and his fingers

kneaded the white, sweating skin of his forehead. His head ached abominably.

The silence in the room deepened. The Molinarian raised his head, stared at the wide mirror on the wall.

"Look—" he commanded.

The mirror clouded, swam with colours, resolved itself into a porthole onto another world. Carpenter heard musical notes ringing down the corridors of time, as though giant blows were being struck on the chords that hold the stars in their places. The mirror glowed with the deep star-flecked purple of space, drawing his eyes, his mind, his very being out of him and holding them suspended over an infinite void.

"Look carefully. I will show you some of the future of your race . . . and of mine . . ."

In the discreet restaurant the sounds of glass and crockery came as a background to weird, multi-toned music from a five-piece orchestra. Captain Cannon Rennison sipped his

thick wine appreciatively, but his eyes were hot and angry on his wife, sitting pale-faced opposite him. He moved his incredibly broad shoulders in his Space Guard Black and spoke bitterly and reproachfully.

"But all the Rennisons have been soldiers! Right the way back for hundreds of years. And now you say you don't want our son to be a soldier! Have you lost your mind, Laura?"

"No, Cannon. It's just that—" Laura Rennison shrank miserably into her chair. "I don't want him to go fighting and slaying over every new planet that we discover. I want him to make a name for himself—"

"Laura! I suppose you realise you're married to me? You're talking as though you loathe the thought of a soldier. Why don't you want our son to be a soldier?"

"You'd never understand, Cannon! When we were told that we might have a son, I was glad, for both our sakes. But I don't want him to be a



fighting automaton. And, Cannon, darling, I love you! But I want our son to be an artist, or architect——”

“Artist!” Rennison was outraged. His burly, high-coloured face with the beaked, arrogant nose, flushed in shocked disbelief. He waved the waiter impatiently away, and the waiter’s slender, thin, angular body and legs twisted forward, bringing his six-foot long arms across the table in deft motions of filling wine glasses just to the brim.

“Artist!” Rennison growled again. “Scum! Parasites clinging to our civilisation. They produce nothing, do nothing to earn their bread. For all they care the war against Molinar might as well not be fought.” He grasped the freshly filled wineglass. “Why you had to bring me to this sort of restaurant I didn’t know. But I see now. Artists! It makes me itch!”

Laura was vainly trying to check her tears.

“Listen to me, Laura,” Rennison went on, savagely. “Be-

yond the Molinar cluster there are millions of other suns and planets, all waiting for the plucking. They’re rich and ripe and sitting waiting for Earth. Our son, when he’s born, will be bred a soldier. He’ll have the big chest and broad shoulders of his father. And with fresh treatment, he’ll be tougher and better than I!”

“But, Cannon, please——”

“Tomorrow, Laura, you’ll be irradiated. And the Carpenter process will ensure that we have a soldier for a son.”

A shifting and a blurring. A vertiginous sensation of falling, the mirror flushing with the scattering of a million stars.

A planet. Broad and Earth-like, with great rivers winding down through pleasant, fertile plains to a sparkling sea. And over the planet the stench of death and decay. A spaceport newly constructed. Like a hard china plate tossed down onto a bed of moss.

Port Commander Rollins

had been a spaceman. His small, wiry body and long, dextrous arms, completely suited for life aboard spaceships, slumped now despondently in his chair of office. He waved away the caricature of a man standing deferentially before him.

"As soon as the ore is here, we'll ship it. Your job is to ensure that the ore arrives here. Understand? Now, get out!"

The miner saluted clumsily and left. His body was broad-shouldered and long-armed, with tremendous muscle development over the back. His body was dwarf-like and his legs were barely long enough for him to bend his knees.

Rollins grunted and flicked up a toggle.

"How's development of the new field coming along?"

The voice that came from the speaker was desperate, with an awed fear riding it that sent shivers up Rollins' spine.

"It's just the same, Commander. The Molinarians sim-

ply refuse to leave their homes. Or, at least, what were their homes."

"I told you to have men remove them."

"I did—whilst we were destroying their houses to make room for the landing strips. But they kept on coming back and sitting down in long lines where their homes had been."

"Well, it's no use them sitting there now, is it? I mean, there's only a concrete landing site now."

"I know." The voice over the speaker was jittery. "But they still sit there, silent, waiting. Every time we move them off they come back again. I've got three ships waiting to come in for planetfall."

"Three! We'll have a bottleneck soon. You'd better do something about it."

"What can I do? That is, I move the Molinarians off and then, when the ships get set to land, the aliens just come back and sit on the strip."

Rollins breathed deeply,

and his eyes were blind, cancerous growths in his face.

"Let the ships land. Guide them in. If the Molinarians stay, they'll get incinerated. And that'll solve the problem. You've had three thousand Earthmen out there held down to looking after a thousand Molinarians."

"But, Commander, I couldn't——"

"You'll do it, understand? Let me know when the ships have berthed."

The mirror clouded again before there was any more. Carpenter found he was sitting rigid in his chair, the untasted drink in his hand, looking with shocked, disbelieving eyes at the blank, silvery mirror on the wall.

"That was—*horrible!*" Louise breathed.

The Molinarian in the office shifted in his chair and Carpenter's gaze swivelled stiffly, and centred on the alien.

"Why did you show us those little, isolated incidents? Fragments, almost. Why

didn't you show us the whole panorama of the future?"

The Molinarian shrugged in his unearthly gesture. "Was it necessary, Doctor Carpenter? Didn't those two events give you a more vivid picture of the things to come than any wholesale painting of the two civilisations? And—I spared you the worst horrors."

"Why?"

"Because, simply, if you haven't been moved now, if you don't decide voluntarily to give up your research after that, it leaves me only one alternative."

"Give me time," Carpenter said, dully.

The scenes he had witnessed re-enacted their ghastly mimes in his head. That waiter—and that miner! God, what shocking parodies of men they'd been. And that poor girl, Laura Rennison. Dominated into producing an artificially toughened boy who would be a soldier and blast his bloody way over the new planets to come. It was sickening.

More than that, the whole

filthy affair could be laid at his door. He had only to agree to give up his work and that ghastly future would never take place.

He said: "How do you know that if I abandon my research here, someone else will not take it up and produce all the things——?"

"If they do," the Molinarian said, softly, "then they, in turn, will be visited by me. You are the first. That is all."

"I see."

So it still left him with the choice.

Carpenter stood up and walked across the room, went into Laboratory Number One and switched off the cosmotron. He stood, eyes blank, for a long while, his hand resting lightly on the smooth metal flank of the machine. So long. Twenty years. Twenty years in which he had worked and slaved and torn his guts out to fulfil the urgent desires of his dreams.

If he washed his hands of all that now, if he turned his back on his work, a new life

would open for him. The Molinarian could cure him. Of that he was convinced. Louise. *Louise*. There would be a wonderful future for them.

He went back into the study. The alien and the girl had not moved. Carpenter took a deep breath and the red spots of fever fluttered on his cheeks.

He said, flatly: "Sorry, Molinarian. No go. I carry on my work."

"But, Doctor Carpenter——" Louise had crumpled her handkerchief into a ball.

The Molinarian's face was ghastly. His mouth thinned.

"That is your final decision, Carpenter?"

"It is. I think that *homo sapiens* will not distort and pervert my research in the way you have shown. That is only a possible future. It probably won't happen."

The Molinarian's words came vehemently. "It's *my* past! It has happened in my world. You may quote parallel futures to me as much as you wish, but to me, it's real."

"Possibly. To me, it's only a future that may occur. There are an infinite number of other futures."

"I know the theory. But I beg of you, Carpenter, before it's too late. Before I have to take the other measures——"

"What are you thinking of? It's no good trying to send me mad again. My secretary here is aware of the situation. Only one other being with the same knowledge as yourself is sufficient to prevent madness. You should know that."

"I wasn't thinking of that."

"Well?"

Before his eyes the alien changed. The face thinned and grew gaunt. The fever spots burnt on his cheeks and the fever-sharpened glint in the eyes exactly matched the glitter in Carpenter's.

Now, there were two Doctor Carpenters in the room.

"I think I'll just tell Armstrong that I want him," the pseudo Carpenter said in Carpenter's own breathless voice.

"Wait!" Carpenter shouted

and strode across the room, stood looking as it were into a mirror. But this time there was the queasy feeling that right was left, and the mirror image was reversed.

"Before you attempt to wreck twenty years of my work," Carpenter said desperately, trying to think his way round this, "can you give me any other single reason, apart from your stories of the future, why I should stop my work?"

The alien shrugged, in a gesture that now was Carpenter's.

"No. You have been shown what will happen."

"But I don't think man will be like that. I don't think he will do those terrible things to the bodies of his fellows. Louise——" Carpenter swung on her. "What do you think?"

"Don't ask me, Doctor," she cried in anguish. "Please don't ask me! I want you to stop work and look after yourself—I don't want you to die of this disease. But—I love

you, and I want you to do what you want to do. I'm—I'm all confused."

Louise was staring at him with tear-wet eyes. Slowly she extended the gun on her palm towards Carpenter.

He looked at the gun, a puzzled, weary expression pulling down the lines of worry on his face.

"You can put that away, Louise. That won't solve a thing. They very seldom do." He swung bitterly on the alien, clothed exactly in his flesh. "And, anyway, why should I take advantage of this poor devil who can't kill?"

He gazed through the window on the dusty surface of Mars. Louise loved him—she had admitted it. He had known for a long while how she felt; but to hear her say it, like that, openly—

"Why did you make Katrin's doll walk with your telekinesis?" he asked the alien, swinging round abruptly.

"Why? That was an early attempt to influence the children of your experiments. But

they were too naive for it—the whole process would have been too slow. You were the obvious answer."

"I visualised men and women living more comfortably and happily on Mars, on the other planets and satellites. I came to Mars, full of responsibilities and worries and overwork. The environment, the choking dust that even the filters couldn't eradicate then, saw to it that I succumbed to this crawling germ in me. So I got T.B. Don't you think that was a strong enough urge to finish my work? And now it's all to stop. It just isn't fair!"

"You mean——?"

"I can't forget that Laura woman. Oh, sure, plenty of women before this have been told that their sons will be soldiers. But it's different, somehow, when you know that your son's body will be altered and changed so that he can batter his way roughshod over other forms of life."

"Doctor——" Louise said, and stretched out a hand.

"Listen to me, both of you. I know that by using your superscience, Molinarian, you could see to it that all kinds of awkward things happened to me. I've had some, and am fully prepared for more. But when you change yourself into a semblance of me, threaten to call my assistant, Armstrong, in and give him wrong orders, then I can see the red light. What might you do to Louise?"

"I was hoping you would not compel me to that."

"You know, if you tried anything, that I'd shoot you without compunction?"

"That I know." The Molinarian's face that was Carpenter's own, creased into a weary smile. "That is why I did not try that gambit at the beginning."

"Well, don't start now. I can see what might be the pattern of the future. Life twisted and defiled. But, get this straight—you personally won't live to get back to your own time if you try anything clever with Louise."

The buzz of the exterior 'phone shocked into the tenseness of the room like a ribald shout in a cathedral.

Louise answered, automatically competent.

"Earth? Yes. Run it through."

The recorder attached to the 'phone purred into action and Carpenter knew that the message that had been beamed from Earth was now being recorded here in the office. It saved the annoying time-lag. Louise put the 'phone down beside the interoffice 'phone cradle and glanced at the smashed handset on the floor. Bending down, she released the spool and clipped it back into the recorder replay. The voice that came out was mechanical and official.

"Message for Doctor Carpenter from Senator Charrington. Cancel previous request for more information and put new instructions on record. Full pressure will be brought to bear at investigation committee meeting for

every assistance to be given to the Carpenter Eugenic Research Station. Expect further appropriations to be generous. Work on eugenic control must be hastened . . .”

At a curt gesture from Carpenter, Louise cut the recording and the silence washed back into the office.

“So you see, Carpenter?” the alien said.

“See what?”

“Someone on Earth has had the idea. From this moment there will be certain men planning to control people’s bodies, change them, force a new culture pattern and a new sort of society based on level of function.”

“You mean your deadline has passed?”

“In a way. We can still do a great deal to stop the work here, but it will mean tremendous efforts on our part to stifle all research on all your planets.” The Molinarian’s voice had a sick, hopeless quality to it.

“You can’t mean that you’re too late?”

“Perhaps——” The alien shrugged, and began to change his form again, flowing and melting, easing out the lines of pain and worry that were etched into Carpenter’s features. Louise gave a little gasp.

“You were the man who came to see Doctor Carpenter. The man who disappeared so mysteriously.”

“That is so. If I had seen him then, perhaps——”

“Forget that,” Carpenter said, roughly. “You mean that now it is too late for me to decide to abandon my work here? After all that damned upset you gave me, now it doesn’t matter what I decide?”

“Not quite.” The Molinarian began to help himself to whisky, unasked. Human or humanoid, Carpenter saw his alien hands were shaking. “It makes it much more difficult for me, though. We can’t assume that to stop the work here would mean a general abandonment of similar lines of research after the Earth Government have expressed such a strong interest.”



"Wonder what Merrick and Mackenzie will think when they get that order," Carpenter mused. "The irony of it! When I begin to feel that I can't take any more pressure, that it would be so much easier to drop everything and crawl into some soft hole away from all this—bingo—Earth comes up with the very idea we're trying to prevent."

Louise said softly: "There's something you've both overlooked." She went on quickly when they would have interrupted. "No. Listen. You've both been taking this whole thing from the angle of Carpenter against Molinarian. Well—surely—isn't it really the future nastiness of Earth against both of you two together?"

"My God!" said Carpenter.

"Your secretary is right, of course."

"We think along similar lines, my friend," Carpenter said, his jaws feeling as though he had been cracking nuts. The pain behind his eyes was like a dull flame, eating in and

making it hard to think. "You want a peaceful life in the Galaxy at your period of time. I do not want Earthmen to be depraved in the way you've shown me. So we ought to be able to co-operate."

"There's good and bad in all men," Louise breathed. "Oh, Doctor, if only you can find some way to prevent the horrors we have seen—and yet not waste your years of effort!"

Carpenter was thinking back to lunch and Wheeler quizzing him on the superman concept. Doctor Hamlin saying in as many words—Why didn't Carpenter fiddle with men's minds and thus eradicate the killing lust? He still had that reluctance to interfere with metaphysical conceptions, but now the matrix of cause and effect had been changed by an alien.

"You mentioned your philosophy, Molinarian," he said, thoughtfully. "You said you had a cognition of mysteries that far transcended anything known on Earth."

He paused, and then said: "Why don't you kill?"

The Molinarian smiled, his tight, artificial face very human. "Our way of life precludes that. Our philosophy——" He stopped, swallowed, and went on: "Our philosophy——"

"Yes!" Carpenter shouted. "Yes, we can! Give me your philosophy and I'll incorporate it with the new children we create up here. Then Earth will never have need to descend to the squirming horrors that we have seen in the mirror. Stretch out a helping hand, alien!"

"I've been a blind, stupid sort of thing, haven't I?" the alien stated flatly. "With the contact with a man of your integrity, Doctor Carpenter, I should have realised at once that that was the answer. Share our concepts of life with you! Turn the Galaxy into a peaceful, prosperous, friendly association of systems. What a dream that is!"

"And a dream that I can make flower, beginning here,

at the Eugenic Research Station. All the new children, created at the behest of the Earth Government, will be new in body and new and fresh in mind, also. They will be perfectly suited for the great step of crossing the Galaxy."

Carpenter chuckled with the wonder of it all.

"Perhaps, who knows, they will be the supermen everybody's afraid of, after all."

"Superchildren," Louise said, rising and coming over to him. She put her hand in his and stroked away the trembling that shook his fingers. "Superchildren, with a benign philosophy of life that can bring only good to the Galaxy." She smiled at Carpenter. "The Molinarian can cure you, you know. Don't forget that."

"I haven't," he said, huskily. "And of the new, better, clean children, one will be ours."

Outside, in the gathering darkness of the Martian night, the first stars were beginning to shine.

# ALL ABOUT COMETS

by John Tayne

Very few people have seen a comet, but anyone with a life-expectancy of at least thirty-two years will see one before they die, for the famous Halley's comet is due to return to our skies in 1986. This will be pretty big and anyone who is not half-blind will be able to watch its slow progress through the night. Most comets are so small that they can be seen only with a powerful telescope.

What should you look out for? A great flashing light? No. Comets don't seem to move when you look at them. It's only when you come back a day or two later—or, rather, night or two later—that you can see that its position has changed.

They are so big—the naked eye ones—that they appear to be very near. Actually they are a very long way away. You can guess how far when you realise that comets are always considerably bigger than Earth; sometimes they are as big as the Sun. On average they work out at about ten times the diameter of Earth.

Comets have a definite structure. There is a *tail*, con-

sisting of luminous gas and fine dust particles, stretching over maybe millions of miles of space. This tail is always turned away from the Sun when the comet is in the Sun's vicinity. This is because the particles that make up the tail are so very small that the light rays from the Sun actually exert a pressure on them, and the net effect is that the tail is pushed in a sweeping curve away from the source of the light. It has also been put forward that the Sun's magnetic field or electrical field is of the same charge, *i.e.* sign, as that of the comet. And, of course, like charges repel each other. So perhaps the curve of the comet's tail is caused by both of these factors.

At the head of the comet is, appropriately enough, the *head*. This is composed of two parts. One is the central *nucleus*, though it must be admitted that quite a few comets have been observed that seem to be lacking in this constituent. Anyway, when there is a nucleus it is very dense and extremely bright. Surrounding it is the *coma*, very large,

rather tenuous and not nearly as bright as the nucleus. Nucleus and coma together usually have a diameter of about 15,000 miles, though a few comets have been recorded with heads of only 500 to 900 miles across.

But although we talk of the structure of a comet, you mustn't think that all the parts are permanent and that the comet moves through space as a whole. It doesn't. The head is continually feeding material into the tail, and the tail is continually losing material to space. Bits and pieces just drift away. Some of them get into Earth's atmosphere and become meteors or shooting-stars. We used the word "continually" rather than "continuously" because the material in the head does not move into the tail in a steady stream; it moves backwards in "puffs." As the material moves farther along the tail, away from the head, it increases speed. When it leaves the head it is usually moving at something like half a mile a second, but towards the end of the tail the "knot" of head material may reach a speed of more than 57 miles a second—which is pretty fast!

But some comets have no

tails. The explanation that has been given of this is that comet heads only give off tail material when they are of a certain size and nature. It is well known that *no* comets have tails when they are not moving near the Sun. It is as though the sunlight-pressure pushes the tenuous stuff off. And since the tail is being continually lost to space, the total mass of the comet decreases. But it is believed that there comes a time when the total mass of the comet is so small, or is of such a nature, *e.g.* very dense, that the sunlight-pressure is no longer strong enough to produce a tail.

A number of astronomers have spent most of their lives analysing comets. Of course, they don't do it with test tubes and chemicals! They use the spectroscope. In case you are not too sure what this is, I'll explain. When light from the stars or the sun or a comet or anything else is passed through a prism, it is split up in the colours of the spectrum. And on the spectrum can be seen dark lines, corresponding to a line that is formed in the spectrum of some element. For example, when sodium is burnt and its light passed through a prism, a dark line—

called the D line—appears where yellow and orange meet in the spectrum. So, if you find a D line in light coming from a comet, you know that it contains sodium. Similarly with other lines.

Using this method, astronomers have shown that comets contain sodium, hydroxyl, amide and imide, cyanide, carboxyl, nitrogen and a peculiar molecule composed of just two atoms of carbon—the like of which never occurs on Earth. All of these are in the head. One or two ionized molecules (such as  $\text{CH}^+$ ,  $\text{CO}^+$  and  $\text{N}_2^+$ ) have been found in the tail but that is all.

Now this analysis is not at all as simple in the case of comets as it is in, say, the case of stars. This is because it is thought that comets do not wholly shine by their own light; and indeed, that the amount of light coming from them is only very slightly self-luminous.

The idea is that there is so little *to* a comet that it couldn't possibly produce the temperature required for the amount of light that comes from it. So it seems that most of this light is indirect sunlight. This is not simple reflection. The Sun's rays do

not merely bounce off the comet; they are absorbed and then re-emitted, often in a different wavelength. This, in other words, is a fluorescent phenomenon. But it is not similar to the ordinary fluorescent tube, for there the rays emitted are different from those received, and it is believed that comets send out rays that are the same in length, etc., as the ones they receive. This is known as resonance-fluorescence.

Experimental confirmation of this idea was obtained by comparing the strength of equivalent rays in sunlight and in cometlight. It was found that rays which were weak in the sunlight were weak in cometlight and *vice versa*, all the way through the range of strengths.

When the astronomer Halley worked out that comets move according to Newton's laws of gravitation and had orbits, he cleared away a very persistent superstition. Until that time—some 260 years ago—people thought that comets were some kind of sign of impending peril, such as famines and war and similar disasters. The idea was dropped when it was proved that comets appear

quite regularly whereas disasters have a way of just happening, and can certainly not be predicted as far ahead as the appearance of a comet can be predicted. Halley, in 1682, was watching a comet and plotting its path, when he suddenly realised that it was moving along just the same track as had been recorded for a comet seen 75 and 151 years before. Halley decided that one comet was responsible on each occasion, and he forecast that this particular comet would come back into Earth's night sky in 1759. And it did, although Halley was dead by then, and did not see his prediction come true.

Comets usually move along tracks that are highly eccentric ellipses. This means that their orbits are considerably narrower than they are long. The funny thing is that measurements of comets' paths indicate that they travel in parabolas. This is impossible, for then they would never return but just go sailing on to the never-never land that lies at the end of Einstein's infinite-but-bounded space.

This *may* happen at times, for some comets, if they

return at all, will not do so for many thousands of years, and there is no record of their having passed through Earth's skies before—for the simple reason that there weren't any astronomers all that time ago. Thus, though we may follow a comet far out into space and chart its path as a parabola or hyperbola—and *then* say that this is impossible, we *may* be wrong. Maybe that particular comet isn't coming back.

The newer, larger telescopes have been able to show that though a nearby comet's orbit looks hyperbolic or parabolic, when you trace it to really great distances, you find that it is an ellipse after all. Nevertheless, it is thought that sometimes a comet may come into the vicinity of the Sun on an elliptical orbit, and then come so close to one of the larger planets like Jupiter that its path is altered into a hyperbola or parabola. Then we never see it again.

All this leads astronomers to believe that once upon a time the Sun had a large family of comets, just as it has a family of planets. Gradually, over many thousands and hundreds of thousands of years, comets have been

shooting away to become lost in space. And no more have have been added. Thus, we can presume that one day there won't be any more comets. All will have been deflected from their elliptical orbits by the gravitational pulls of the major planets.

Sometimes comets have very nearly come to a holocaustic end by plunging into the Sun, the way moths are said to bring themselves into a candle flame. One or two comets have actually passed through the Sun's corona. They did so at a speed of 300 miles a second, so we can assume that, like the Indian fakir fire-walker, they spent so little time at high temperature that they escaped with comparatively little damage.

But 300 miles a second is not the average speed of comets by any means, though all that get so near to the Sun probably move at that rate.

Even so, some of the ellipses are so long that the comets might just as well approach the Sun from infinity—and they quite often streak past the Earth at 26 miles per second, the speed they would have attained if they'd come from so far away that we couldn't even conceive the distance.

One little-known—outside astronomical circles—group of comets is the so-called Jupiter's Family. This family consists of about 30, not very bright, comets that have orbits of low enough eccentricity to take them only a short distance from Jupiter. Each time they pass the giant planet they are slowed down; their returns come more and more rapid. Encke's comet turns up every three and a third years. What will happen to these little comets in the dim future nobody knows. But no doubt somebody cares!

*Sometimes, foresight is not enough.  
You need courage too.*

# DEATH DEFERRED

by E. C. TUBB

He awoke to the sound of screaming madness and lay for a moment, nerves tense and ears strained, his heart thudding painfully against his ribs.

Around him the sirens filled the night with their pulsing wail, shredding the darkness with heart-stopping noise. Starlings, perched in ranked array on the ledges of ancient buildings, jerked awake and twittered in sleepy protest and, mingled with both bird-noise and warning, came the soft murmur of wings, the throb of jet-disturbed air, and the thin, whistling scream of rising interceptors.

Jeff Harrigan swallowed, pressed the switch of the bedside lamp, and stared into unrelieved darkness. He swallowed again and found the flashlight he had kept in readiness for the past nine months, blinking as its bril-

liant shaft cut across the room.

A woman sat up in the bed beside him and brushed dishevelled hair from her eyes.

"Jeff! What's the matter?"

"Get up," he snapped, and threw his legs over the edge of the bed. "Hurry!"

"Jeff!" She stared at him, her eyes wide with panic. "Is it . . ."

"Yes," he said, grimly. "Hurry!"

He grabbed her by the arm as she fumbled, still not wholly awake, with slippers and robe.

"No time for that. Now hurry, damn you! Hurry!"

Desperately he jerked her away from the bed and out of the room, the flashlight glancing from the walls as he ran down a short corridor, dragging the woman after him and ignoring the pain from his



tender feet. A door gaped in the right-hand wall, a short flight of stairs led into darkness, a landing, another flight, a sharp turn and the light shone down a narrow passage and reflected from the metallic sheen of a thick door, hanging half-open, mid-way down the corridor.

He passed it, halted, flung the woman from him, and threw his weight against the inside of the door, almost gibbering with panic as the heavy portal resisted his efforts.

"Lorna! Help me!"

Together they pushed against the thick door, then she hesitated, stepping back and shining the flashlight down the passage towards the stairs.

"Jeff, I think that someone's coming."

He ignored her, his heavy features mottling with the effort of moving the thick door, his bare feet thrusting against the rough concrete of the floor.

"There is someone coming, Jeff." She squinted down the beam. "It's George!"

He pretended not to hear,

grunting as the heavy door swung towards the jamb.

"Jeff!" A man thrust against the outside of the lead-sheathed panel. He pressed, and for a moment both men struggled, one against the other, as one tried to open, the other close, the passage.

"Jeff!" Lorna screamed at her husband, her mouth ugly in the reflected beam of the flashlight. "It's George! Let him in."

"I . . ." Jeff swore and stepped back, letting the man squeeze through the narrow gap, glaring at him with hate-filled eyes.

The first bomb fell.

Sound thundered across the city, blasting the sirens into silence, and the house creaked and glass sprayed in a thousand shards beneath the rolling hammer of incredible noise. For a moment it seemed to fill all heaven and earth, numbing the ears and dulling the mind, then it faded and in the following calm the thin screams of women and the startled shouts of men echoed faintly above the groan of collapsing walls and splintering beams.

Jeff whinnied with animal fear as he flung his weight against the door, both the woman and the man helping him to slam it against the rubber gaskets and spin the locking wheel. Then, running like madmen, they raced down a zig-zag corridor and past another thick, metallic door.

They closed it just as the second bomb exploded in sun-bright splendour over the helpless city.

Sound vibrated through them, shaking the very earth, and they quivered as though they stood in a high wind. Heat lashed at them, bringing great beads of sweat to their skins, and, high against one wall, something chattered in mechanical frenzy.

"Two," whispered George in the flashlight lit darkness. Shadows crawled over his face as he crouched in one corner of the tiny shelter, and blood trickled from his bitten lips as he counted off other, fainter tremors of sound. "Three! Four! Five! . . . Five!"

"Is it over?" Lorna shivered as she hugged her shoulders, her white skin gleaming

through the flimsy material of her nightdress.

"How do I know?" Jeff wiped sweat from his pudgy features. "They may come back, drop more bombs, anything."

"I doubt it." George rose from his crouched position and stared around the tiny, shadow filled room. "Five bombs would be more than enough. I think that it must be over."

Jeff grunted and swept the beam of the flashlight over one, damply marked concrete wall. A switch revealed itself and he threw it, filling the shelter with light from a single dim bulb. He snapped off the flashlight and put it on a low shelf, then stepped over and stared at the slowly chattering Geiger counter.

"How is it?" George crossed the room and stared at the instrument. Jeff shrugged.

"We got a pretty heavy dose of radiation when that bomb fell. It must have been almost overhead, or at least too near for comfort, but I think we'll be all right. The count has gone down to well below the danger level."

"Does that mean we're going to die after all?" Lorna joined them, her face strained and her eyes wide with terror. George smiled at her.

"No, sis; the dose was heavy but not bad enough for us to worry about." He stared at the cadmium concrete walls. "They must be pretty thick to have stopped what they did."

"Fifteen feet," said Jeff, proudly. "And forty feet below the surface. I built a large fish pond directly overhead; made it ten feet deep and large enough to cover the shelter, and water's pretty good at stopping radiation."

"Yes," said George, slowly. "You certainly took good care of yourself."

Jeff stared at him, seemed about to speak, then moved away.

He was frowning as he checked the gauges on the ranked cylinders of bottle air.

Later, when both he and Lorna had dressed in spare clothes kept in the shelter for just such an emergency, and Lorna had heated coffee over a small chemical stove, he stared at the tall, slightly

gangling figure of his brother-in-law.

"What happened out there, George? You were on Civil Defence I remember." There was a barely hidden sneer in the words and George flushed as he stared at the older man.

"I was," he admitted. "By rights I shouldn't be here at all, but I was off duty, on my way to the post to take over, when the sirens went. I ran all the way here, smashed my way in, and..." Heshrugged. "You know the rest. Ten seconds later and I'd have been shut out."

"Yes," said Jeff, and smiled at his wife. "If you hadn't been my wife's brother you'd have been shut out anyway. You can thank Lorna for saving your life."

"Thank you, Lorna," George said, obediently. He looked at the pudgy man. "Well, Jeff? What happens now?"

"We wait until the rescue parties come." Jeff smiled with quiet satisfaction as he looked at the small, cluttered shelter. "We have plenty of food and water, accumulators for light and bottled air to

last until the air is safe to draw through the surface vent. We could live down here for six months, if we have to, but they'll be here long before then."

"Will they?" George stared down into his paper cup, half-filled with tepid coffee. "What makes you so sure?"

"Of course they'll be here," snapped Jeff, sharply. "I'm a Government man, a *valuable* man, and they know where I live. Aside from that the Civil Defence Rescue Squads will do what they can to save life and property. It's just a matter of time."

"Six months' time?" George shrugged. "I hope that you're right, Jeff, but I'm not so optimistic."

"Why's that, George?" Lorna sat down beside her brother and stared at him with worried eyes. "Jeff has everything worked out, haven't you, Jeff? He built and stocked this shelter so that we would be safe in case of a raid, and we are safe. The fact that we are sitting here drinking coffee proves it. We've got nothing to worry about at all."

"Are you trying to convince

yourself, or me?" George shook his head. "Look, Lorna, I don't want to worry you, but I don't think it's all going to be as easy as you seem to think. We counted five bombs, one of them almost directly overhead, and that means that London has been practically wiped out. Even if the rescue parties were still operative, they would have more than they could cope with to help the radiation victims on the fringe of the area; they couldn't possibly bother with the lifeless portions towards the centres of the blast."

"London wiped out!" Lorna shook her head. "I don't believe it. Five bombs just couldn't do that. Jeff, tell him that he's wrong."

"Of course he's wrong," snapped Jeff. "Don't worry about it, dear. In the course of my work I've seen the White Papers on atomic missiles. No nation would use five atomic bombs on a city, they cost too much for one thing, and . . ." He let his voice trail into silence and scowled at the younger man.

"And what?" prompted George. "Would it be that

they blast the area too much for occupation, and that no nation would want to reduce a city to useless rubble?" He licked his lips with a nervous gesture. "You're out of date, Jeff. In the old days it was good policy not to damage your enemy too much. You had to think of post war trade, reparations, foreign markets, and a ruined country couldn't buy goods. But that was the old days. Now we have new weapons and new policies. London can go, Manchester, Liverpool, all the major cities can go. All the enemy would want from us is an advance military base and a self-supporting agricultural economy. They can supply all the manufactured goods, and they will—to the few left who can use them."

"They wouldn't do that," said Lorna, desperately. "Not wipe out London I mean. Why, the very thought is ridiculous; they just wouldn't do it."

"They've done it," said George, curtly, and in the dim light his face looked yellow and sick. "You heard them; five bombs they dropped, and

five bombs would be more than enough."

"Impossible!"

"Why? We can assume that they dropped them in a rough circle around the centre, say ten miles out from a common point. The blast area of the bombs would be at least ten miles. The effect would be a ring of destruction around a relatively clear area in the centre of the city, the Abbey, say, and the old city, the docks perhaps, and government buildings. The rest of London . . ." He shrugged, and moved his hands in a peculiar gesture. "Finished!"

"Nonsense!" Jeff wiped his face and glared at the young man. "You don't know what you're talking about. The bomb used on Hiroshima destroyed less than five square miles; the one used on Nagasaki less than two. You are assuming that the ones dropped on London have each destroyed about eight square miles. The idea is absurd!"

"Is it? The bombs you're talking about were the early, uranium fission type, and even then we knew of the

hydrogen bomb. You forget, Jeff, there have been twenty years of improvement since then. Twenty years to forge the weapon which will finally do what man has been trying to do ever since he first learned to walk—wipe himself out!”

In the following silence the muffled sobs of the woman sounded strangely loud.

The radio was a small, battery powered set, and it should have been able to pick up most European stations, but all they could get was a blurred hum. Jeff crouched over it, slowly turning the dials, his ear tight against the speaker, frowning at every sound made by the other two. After completing the tenth circuit of the wave-band he grunted and switched off the set.

“Any luck?” George craned his head over the edge of one of the two narrow bunks.

Jeff shook his head. “Nothing.” He glared at the radio. “I can’t understand it. There should be at least one station operating, but all I get is a fuzzy hum.”

“Maybe it’s because of the radiation? One of those bombs exploded pretty near and that would make everything radioactive, wouldn’t it? Perhaps the radiation is blocking the channels, like static or something.”

“After a week?” snapped Jeff, irritably. “The radiation should have died by now.” He sniffed at the stale air. “All my precautions were based on known data about the bomb. The bottled air won’t last much longer and soon we’ll have to open the surface vent. The outer air should be harmless by now, but if it is, then why doesn’t the radio work?”

“Perhaps all the stations are off the air.”

“All the stations in England and Europe? Impossible!”

“Why? If they bombed London then what’s to stop them having bombed other cities? Then we’d have retaliated and so on.” George sucked reflectively at an unlit cigarette. “For all we know every major city has been bombed by one side or the other and none of the stations are broadcasting.”

"But the air can't be wholly dead," snapped Jeff, irritably. "There'd be army units, ground forces, Civil Defence. They all use radio and they couldn't all have been bombed. Why can't we hear those?"

"Different wave-lengths?" George shrugged and rolled from the bunk. "Let's play some more bridge. Fetch the cards, Lorna; we can't just sit here glaring at each other."

Jeff swallowed, half-annoyed with himself for revealing his emotions, but a whole week cooped up with a man he despised and a woman he had married for her beauty and not her brains was telling on him. Coupled with that was a gnawing fear that maybe things weren't going to work out as he had planned.

Impatiently he watched his wife drag up a crate and fetch the cards. He cut, tried to shuffle, spilled most of the pastboards to the dirty floor, and swore as he picked them up.

"Damn!"

"Let me help." Lorna stooped and collected the scattered cards. "Here." She put them down on the im-

provised table. "Should I put the dinner on now?"

"A good idea," said George before Jeff could answer. "Let me see now." He stared thoughtfully at the dim bulb. "How about some nice hot soup, some chicken, peaches and cream, cheese and biscuits and perhaps a bottle of something to wash it down?" He grinned at Jeff. "That suit you?"

"Like hell it does! Where do you think you are—the Savoy?" Jeff glared at Lorna. "We'll have cold soup and some of those army biscuits. We've got to make this stuff last."

"Why?" George stared at his brother-in-law. "We may as well eat it up while we've the chance, and I know that you've stocked this place pretty well. What's wrong in having a decent meal for once?"

"I'll decide when we eat and what we eat," Jeff said, coldly.

"Please, Jeff," said Lorna. "Can't we have something nice for a change? I'm getting tired of cold food and my stomach hurts."

"Hurts?" Jeff gulped and reached for a slim volume. "Have you any inflammation of mouth and throat? Fever? General sickness?"

"No."

"Are you sure?"

"Stop worrying her, Jeff," said George, tiredly. "If we've had an overdose we'll know it soon enough, but if we had we'd have known it by now. How about this food?"

"You heard what I said."

"Hearing it and liking it are two different things," said George, quietly. "How long are we supposed to eat starvation rations when the shelter is stocked with crates of canned food?"

"It's my food."

"And Lorna is your wife and, in case you've forgotten, my sister."

"That's my affair," said Jeff, coldly. "You forget that if it hadn't been for my foresight you'd both be dead now instead of sitting in safety. I didn't invite you here, George, and to be frank I didn't want you here, but you may as well get one thing straight. This is my shelter and don't you forget it."

"I won't forget it, but need we talk about it?"

"Why not?" Jeff glared at the thin man and felt the warm glow of righteous anger. "It cost me more than ten thousand to have this shelter built, and I had to put up with a lot of ridicule from fools who thought I was wasting my money." He smiled as he thought of them. "They're dead now, all of them, but I'm alive, and by God I intend staying that way!"

"Why?"

"What!" Jeff stared helplessly at Lorna. "Is this brother of yours insane?" He looked at the younger man. "Because I've got brains and foresight, that's why. Because I had the sense to see what was coming and do something about it."

"You had money," reminded George. "How many people could afford ten thousand pounds to build a private shelter?"

"What does that matter? I had the money and I spent it. Others could have done the same. Everyone could have done something, but how many did? Am I to be



sneered at because I looked after my own?"

"Did you? I'll admit that you looked after your own skin, but why didn't you do more?" George thinned his lips. "If you were so certain that atomic bombs would be dropped on London why didn't you do something about it? I don't mean something like this hidey hole of yours, this private nest where you could run to save your own hide, but something to save others' skins, maybe even something to prevent the war happening at all."

"What could I have done?"

"You're a member of the government and you must have known what was going on. Did you do anything about it? Did you stand up and protest, appeal, work for the poor devils who voted you into power? No. You just sat and followed the leaders of your party like a well-trained dog, and all the time you knew that, no matter what happened, your own greasy hide would be safe. Am I supposed to be proud of you for that?"

"You . . .!"

"You don't like me do you, Harrigan?" George shrugged.

"Well, that makes us even, because I hate your guts. But you married my sister, and for her sake I've kept quiet about how I feel. I'll continue to keep quiet, but I can't stand any more of your slimy self-satisfaction at what you've done. Personally I'd rather have gone out with the rest than grab a bit more life the way you've done."

"You would," sneered Jeff. "You made such a success of your life, didn't you?"

"I was a waster," admitted George, calmly. "But I hurt no one and, if I didn't live as I should, then I could have died as I ought."

"Then why the hell didn't you? Who asked you to come here in the first place?"

"No one."

"Then why did you come at all?"

"I was afraid," said George, slowly. "You should know how I felt; you've lived with it for years now. Fear. Fear born of a little knowledge, of knowing what would happen should the bombs fall, and yet denying that they could fall at

all. Then, when I heard the sirens, I panicked. I ran at top speed for over a mile, stumbling through the lightless streets, bumping into people, cursing them, smashing them out of my way. All I could think of was getting here, getting to shelter away from the bombs. I almost went crazy when I saw you shutting the door." He stared down at his hands and sighed. "I'm afraid that I'm not a very brave man."

"So you admit it."

"I've never denied it." He looked at the pudgy man. "But I keep remembering how I felt, the panic clawing at my guts and the insane fear, and I knew that I might stand a chance if I could only get here in time. What of the others? The millions of men and women who just had to sit and wait, without hope and without a single chance at all? They relied on people like you, Harrigan, you and those they voted into power. You failed them. You left them to wait in the darkness while you ran like a rat to your bolt hole; left them to die in their millions, half of them never

knowing what was happening. How does it feel to be the murderer of a city, Harrigan?"

"Damn you! You talk to me like that after I've saved your life? Sitting here and eating my food, drinking my water, breathing my air! At least you could be grateful for what I've done."

"Then I'm grateful," said George, tiredly. "Now let's forget it, shall we?"

He turned to help Lorna prepare the food, and Jeff scowled as he saw them glance at each other in silent understanding.

Two days later they opened the surface vent.

Jeff grunted as he strained at the wheel controlling the valve and George helped him, throwing his weight against the metal.

"No good," he gasped after a concerted effort. "It's stuck."

"We've got to get it open." Jeff gasped as he breathed the stale air. "The bottled oxygen is exhausted and we daren't open a door for fear of radioactive dust. Lorna, come over here and give a hand. Ready? Now!"

Together they strained at the wheel.

"It's moving!" grunted George. "Try again." His face mottled and veins rose on his forehead and neck. Metal grated, grated again, and abruptly the wheel spun free. Jeff reached for a portable Geiger counter, flicked the switch of a small pump, and waited, sweat glistening on his face as he listened to the chatter of the instrument.

"How is it?"

"Wait!" Jeff licked his lips as he stared at the dial of the Geiger, and its mechanical click rose to a soft purr.

"Can we breath it?" Lorna thrust forward, her lips parted, as she gasped the thick air. "It's stifling in here. We've got to be able to breath it, Jeff. I can't stand it down here much longer."

"You'll stand it as long as you have to," snapped Jeff, curtly. "It isn't too bad, and anyway, we have no choice."

He twisted a handle, threw more switches, and pumps whined as they sucked air from the surface and expelled the stale oxygen.

"Will we be all right?"

"Yes, Lorna," said Jeff, with forced cheerfulness. "It's radioactive, but that was to be expected, and it won't harm us."

"Then we can go out now?"

"Not yet. It would be silly to take chances now, and we may as well wait for the rescue parties."

"Wait?" She frowned and looked down at her soiled clothes. "Why must we wait? I want to get some things from the house, clothes, and there's all my jewels and make-up. Why can't we get them, Jeff?"

"The house will have collapsed, Lorna," said George, quietly. "We'll have to wait until they dig us out."

"There's another door at the end of the shelter—why can't we use that?"

"Is there another door, Jeff?"

"Yes. I guessed that the house might go and had an escape tunnel built. We could get out that way if we wanted to, but we'd better leave it for a while."

"But . . ."

"I said that we'd leave it for a while, Lorna!" Jeff glared at

her and she yielded to ingrained habit patterns.

"Yes, Jeff."

"Get some food ready."

"Yes, Jeff."

George watched her as she moved slowly among the stores then looked at the pudgy man.

"What are we going to do, Jeff?"

"Wait."

"But . . ."

"You can do as you wish, George. The door is down there and you can walk out at any time. Personally I'm not the impatient type. I can wait to make sure, and Lorna is going to wait with me."

"I see." George scraped his foot along the dirty concrete. "Then I suppose I'd better stay here with you."

Jeff shrugged.

They waited four weeks, and then another four, and still the rescue parties failed to come and the radio remained dead. Three people tried to live in an area of no more than two hundred square feet, most of which was taken up with crates and ranked accumulators; and the in-

evitable stench from unwashed bodies, retained garbage and animal waste made the shelter a nightmare.

Lorna felt it most, and she dragged her sagging body wearily from crate to bunk, from bunk to crate again. She was ill, more than ill, wasting, perhaps, from radiation sickness or from some subtle ill-health engendered by damp and unsanitary conditions. She had lost appetite, drank too much water and complained fretfully of pains in her head and stomach.

George thought that she was dying.

Jeff didn't care.

He had more things to worry about than an ailing woman. Every day now for the past month, waiting until the others lay in uneasy slumber, he had crept through the thick door at the end of the shelter, crept part-way up the zig-zag corridor, and listened to the mounting chatter of a portable Geiger counter. And each time the mechanical song had spelt one word.

Death.

The ground was still radioactive, still emitting invisible

radiations sufficient to rip the life from a man, break down his cells and body structure, bringing slow but inevitable death. It would be suicide to leave the shelter yet. He worried about it, sitting on an empty box in a corner of the shelter, wondering what could have happened. The bombs obviously hadn't been the normal type he had expected, or perhaps radioactive dusts with a long half-life had been dropped along with the explosives. He didn't know, and even if he had there was nothing he could have done about it.

And the food was being used too fast.

There had been enough to last two people perhaps six months—with rationing. It couldn't last the three of them more than four, and he might die from starvation within a couple of days of safety, the rescue parties arriving just too late, and all his elaborate precautions be wasted. Wasted because some unwanted fool had thrust himself upon him, claiming sanctuary because of an accident of relationship.

It would be so much better if George were out of the way.

The idea came during one trip towards the outer door. The chatter of the Geiger had risen to its soft purr, hesitated, then slowed to a rapid clicking as the counting device changed scale. Jeff stared at it and nodded in sudden decision.

Back in the shelter, he made certain that the others were asleep; then, setting the Geiger down on a small bench, worked with fine screwdrivers and thin wires. Satisfied, he tested the machine and waited for George to make the initial advance.

He didn't have to wait long.

Lorna was the cause as he had guessed she would be. George was worried about her and whispered to Jeff during one of her too-long sleeping periods:

"Lorna's ill, Jeff. I think that she's dying."

"You do?"

"Don't you?" George stared curiously at the pudgy man. "Look at the way she drags herself around and won't eat. I took a fling at studying medicine once and I think that she's got some kind of a

wasting fever. This place is killing her, Jeff. We've got to get her away while she's strong enough to travel."

"Can we?" Jeff pursed his lips and shook his head. "There's still some radiation outside. It may die within the next few weeks. I think it would be best to wait until the rescue parties come."

"I don't think they ever will come," said George, tightly. "No one would expect anyone to still be alive in this area. If we're going to get away we'll have to do it on our own."

"But if we wait another few weeks . . ."

"You can wait if you want to," snapped the young man. "I can't sit here and watch my sister die. I'm taking her with me."

"Don't be a fool, George!" Jeff swallowed and controlled his voice. "We have only two sets of radiation clothing. They aren't very good, just lead impregnated material, but they'll help. Lorna is too weak to carry the weight of one, and we can't leave her here alone. I still think that rescue parties will come, but

they may take some time." He hesitated. "If one of us were to contact them and guide them back?"

"I'll go," decided George quickly. "Is it safe?"

"You can take one of the Geigers. If the radiation is too strong you can return. Here." He reached for the machine he had tampered with. "You see this scale?"

"Yes."

"You're safe until the needle hits the red. You can tell by the sound too if the visual warning seems erratic. The frequency of the clicks is the best guide. You're safe until it changes scale and lifts to a higher register. Got it?"

"I understand." George took the counter and weighed it in his hand. "Where is the protective clothing?"

"In the locker." Jeff hesitated again. "You'd better mark the trail away from here. You may not be able to find your way back again."

"I know what to do," snapped the young man, impatiently. He wriggled into the heavy protective clothing, holding the hood in his hand and staring worriedly at his

sister. "Look after her, Jeff."

"I will."

"You'd better. If I find that you've been neglecting her..." He let his voice trail into silence as he donned the hood. Jeff smirked and led the way to the heavy door.

"The outer door opens just like this one," he said. "You may have to fight your way upward through some rubble, but there shouldn't be much; the exit was in clear ground. Don't forget, listen to the Geiger and come back if you're in trouble."

"I will," said George, his voice muffled beneath the hood. He waited until Jeff opened the door, lifted one arm in salute, and stepped into the zig-zag corridor.

Jeff smiled as he slammed and locked the thick portal.

If George followed instructions he would go walking innocently to his death, exposed to a hundred times more radiation than registered on the readjusted Geiger counter. If he grew suspicious and wanted to return, then the same door which had guarded the shelter against an atom blast would protect it against

an unwanted guest. Either way he couldn't lose, and he grinned for the first time in weeks as he sorted out a tin of peaches and a bottle of Scotch.

This called for a celebration. He was halfway through the whisky when Lorna awoke and called for her brother. She looked ghastly as she lay on the bunk beneath the dim light. Her skin had a grey, clammy appearance, and the whites of her eyes had turned yellow, flecked by thin threads of blood, and crusted at the corners with a yellow pus. She stared up at him, breathing in shallow gasps, and her hair hung in lank trails on the soiled pillow.

"George!"

"I'm here, dear," murmured Jeff and took her thin hand in his own.

"George!"

"George has gone to get help."

"Help?"

"Yes. We'll soon be out of here and in the fresh air and sunlight." He frowned at the blank expression in her eyes. "Here." He put the bottle

against her lips. "Have a drink; it will do you good."

"No. Where's George?"

"Gone outside." He tried to control his impatience. "I told you that before. Have a drink."

"No." She stared up at him and he shuddered at the expression in her bleared eyes. "I'm going to die, Jeff. I'm going to die!"

"Don't be a fool," he said, roughly. "Of course you're not going to die. Not now, after all we did to make sure that we'd live. You can't die now."

Obedience struggled with truth in her dull eyes and habit won. She relaxed on the bedding and wearily closed her eyes.

"Yes, Jeff," she murmured, and drifted into the stupor which seemed to be her normal state.

Jeff shuddered again and sucked desperately at the bottle.

George didn't come back. Jeff waited five days before he dared creep towards the outer door and felt sick as he heard the mounting song of the

Geiger. Even with protective clothing a man couldn't have lived more than a short while exposed to that radiation, and he hurried back to the safety of his underground shelter.

The pumps faltered just as he closed the thick door.

They had hummed steadily for weeks now, powered by the heavy-duty accumulators, and he gulped as he listened to their broken purr. Hastily he changed their connections from the exhausted batteries to fresh ones, frowning as he reckoned on how long it would be before they died from lack of current. The dim bulb seemed to fill the place with shadows and he stared at it, knowing that the amount of current it consumed was infinitesimal, but knowing that he could do without light more than he could do without fresh air.

He switched off the light.

At once panic seized him. The shelter seemed to become a tomb, the air thick and stale, the place odoriferous with the smell of death and decay. He whimpered as he clawed at the switch and the echoes of the



faint sound rolled around him like the whispers of ten million dead. He stared around him, straining his ears to make sure that his wife was still living, grateful for the sound of her ragged breathing, and stared for a long time at the slow rise and fall of her chest to make sure that she was still alive.

He slept badly, starting awake at imagined screams, at sounds coming from the thick door, at the imagined falter of a pump or the tread of feet signalling the arrival of the rescue squads. He awoke to the sound of Lorna's weak call.

"George!"

"George isn't here," he said, his voice brittle with strain. "I told you, he went outside to get help."

"George!"

"Damn it, Lorna! I told you he's not here!"

"George!"

He sighed, giving up the unequal struggle, and took her thin hand in his. "How do you feel, Lorna?"

"I'm dying," she whispered. "I know I am. I can feel it inside of me."

"That's nonsense. You're going to be all right."

"No, George." She struggled to sit up and stared around the shelter with her horrible eyes. "I feel as if I'm already buried. This place is a grave. I can smell it. I know it."

"Stop it, Lorna! You're going to be all right I tell you." Desperation knotted his stomach as he looked at her. "You can't die, Lorna. You can't! I spent ten thousand pounds on making sure that we would live. You can't leave me now."

"Poor Jeff," she whispered, as though he had never spoken. "He wants so much to live, so much. He thought that his money could save his life, but it can't, George. Money never can. All he did was to build himself a grave. And it's a horrible grave, George, a horrible grave."

"Lorna!"

"So much better to have died with the others, out in the clear air and in the company of our own kind. It would have been all over now. No suffering, no sickness, no

fear and worry. Just death, utter, complete, restful death."

"No, Lorna! No!"

She blinked, staring at him as if seeing him for the first time, and her yellowed, blood-streaked eyes held none of their former beauty.

"Why, Jeff! I didn't know that you were here. Where's George?"

"Dead," he snapped, brutally. "Outside somewhere, rotting among the stones. But we're alive, Lorna. Alive!"

"You are, Jeff. I'm dead."

"No, Lorna. You can't leave me now. Not after all I've done for you. Not after all the money I spent to save your life. You can't die now. You mustn't!" He was babbling now, and hysteria had raised his voice until it quivered on the thin edge of madness.

"I need you, Lorna. I can't stay here all alone in the silence and the dark with you lying dead. I couldn't stand it. Please, Lorna, you owe me too much to leave me now."

"I must."

"You can't!" Desperately he gripped her thin shoulders.

"I love you. I haven't told you

that for a long time now, but it's true. I love you. All I did was for you. I took you from the gutter and made a lady out of you. I built this shelter to save your life. You can't die now, Lorna! You can't!"

"Goodbye, Jeff."

"No!" he screamed. "No!"

Then because she didn't obey and because she smiled at him, safe and secure in the fastness of her own secret knowledge, and because he feared the dark and the loneliness and what he knew must be, he slapped her full across the cheek, hard, and the sound of the blow filled the shelter with the soggy impact of flesh on flesh.

Still smiling, she fell back onto the bunk.

He raved at her then, shouting and cursing, appealing to her gratitude, her loyalty, her greed and ambitions. He tried to force whisky between her lips, sat her up and slapped her again, striking the grey flesh until his fingers ached. She didn't mind. She didn't care what happened to her any more and she lay there, still smiling, the marks

of his blows dim against her cheek.

Finally, he accepted the fact that she was dead.

He drank himself into a stupor then, breaking open a stored case of whisky and drinking like a fool or a man desperate with the need of forgetting. He awoke and drank again, fumbling the bottle and giggling as he jested with silent clay. He slept again and woke to harsh reality, turning to the bottle as the only thing left for him in a world bounded by damp walls of cadmium concrete and surrounded by invisible death.

Drinking was the only thing left for him to do, but when the whisky was exhausted, terror waited at the bottom of the last bottle.

It came as a thin, sickly, sweet odour welling from the bunk and filling the heavy air. It came with loneliness and shadows, the sense of being trapped and the knowledge that there could be no escape. It came with the failing of the accumulators and the dimming of the single weak bulb.

It came with droning wings and pulpy red bodies.

Flies, hatched perhaps from air-borne eggs, obscenely mutated and with disgusting appetites. They clustered over the dead woman, breeding, droning about the shelter and trailing their long, hairy legs over his bare face and hands. Once he tried to carry the rotting remains of what had once been an attractive woman out into one of the corridors, but he had left it too late, and the flies droned around him, flecking his naked flesh with blood from a thousand bites, so that he ran, screaming, and flailing his arms as he ran from their food.

Madness came when the lights went out.

He crouched in the dark, listening to the flies, choking in the odour, imagining a thousand things and dying a thousand deaths. He sat and gibbered, screaming insults at those who had died, for denying him their company, and always he had to fight the hungry mandibles of impatient insects.

Sanity returned after the third day.

The lock was stiff and he was weak, but he twisted the wheel with abnormal strength and stumbled into the outer corridor. He didn't need a flashlight and he didn't want a Geiger. The outer door was open, left that way by George, and sunlight streamed, bright and clean, into the last leg of the twisted passage. He strode forward, unaware of the matted filth on head and face, the soiled and tattered clothing on chest and legs, and stood for a moment, breathing the sweet air and basking in the warmth of the late summer sun.

Around him stretched utter desolation, a tormented sea of fused brick and shattered concrete, warped and jumbled as though from the tread of some careless giant, and all silent; as silent as the grave.

No bird sang. No man or woman broke the stillness with their cheerful tread. No child shouted as it chased a toy or called to a friend, and even the red flies seemed to inhabit only the area which held their food. He looked around him, feeling as a ghost might feel when all other spirits had departed for heaven or hell, as a late-comer would feel on Judgment Day, as a man feels when all his race and kind are dead.

Then, because there was nothing else he could do, he began to walk between the ruins, away from the shelter, walking for the sake of bodily movement, glad of the sun and the air, and simply not caring about the radiations which had already doomed him to death.

# MEDICAL PROGRESS

## by 2000 A.D.

*by C. V. JACKSON, F.R.S.A.*

Could the average serious-minded citizen of 1900 have foretold the medical wonders which we today accept all too complacently? Medical science has made such great strides in the last half-century that it would not be fantastic to expect miracles of healing, perhaps knowledge of life itself, to have been achieved by the close of the 20th Century.

First let us pause to consider that great scientific discovery of our age: the splitting of the atom. Its powers of destruction are only too well known. Not so often appreciated by the average citizen is the fact that its promise in medicine is as much a blessing as the atom bomb is a menace to mankind.

Take, for instance, the atom discovery of Carbon 13. This important discovery was made by Professor Frederick Shoddy of Oxford. The Professor discovered the isotopes and then found that Carbon isotopes produced Carbon 13. In those early experiments

only an ounce of Carbon 13 was obtained, but latterly two American scientists, Dr. H. C. Urey and Dr. Allen Reid, have devised a process by which its production has been greatly accelerated.

It has been said that Carbon 13 is perhaps the most powerful aid that has yet been discovered for use in research on such diseases as cancer, diabetes, certain forms of heart disease, and arteriosclerosis. It is expected to provide us with important clues as to the most satisfactory methods of treatment and prevention.

Perhaps the greatest potentiality of Carbon 13 is that with its aid we may yet discover the answer to one of the most elusive of all medical enigmas—the cause and successful cure of cancer. Since it has been claimed that Carbon 13 will enable qualified men to witness normal, healthy cells of the body changing into an abnormal or unhealthy condition, then it is reasonable to presume that careful observations may well

reveal the cause for that change.

Whereas ordinary Carbon has an atomic weight of 12, and after absorption in the body can no longer be traced, Carbon 13 can be followed through the living tissues. Thus your food and drink could be traced on its trip down the alimentary canal, through the stages of its being broken down by the gastric juices, and even after its absorption into the tissues and blood-stream.

After the cure for cancer, there comes, high on the list of medical priorities, first the perfect anæsthetic, and then victory over surgical shock. Ether, novocaine, chloroform, and nitrous oxide have their disadvantages for the surgeon. Even the modern barbiturates, Trilene, and cyclopropane are not free from trouble. Nothing would assist modern surgery more than an anæsthetic which would promote complete relaxation of the muscles. Whilst present-day anæsthetics can be made to induce complete relaxation if a patient is given a large dose, it is a practice which cannot always be adopted with safety.

In this connection, anæ-

thetists have been experimenting with the alkaloid arrow poison, curare, and have met with fair success. When used in addition to an anæsthetic it has been found to induce nearly perfect relaxation, and surgeons have reported upon it favourably.

Of one thing we can be reasonably sure. Even if medical science has completely conquered disease by 2000 A.D., there will always be work for surgeons. We cannot foresee the time when people never suffer accidents. But it is also fair to say that the advent of new drugs has already reduced the need and scope for surgery in such conditions as tuberculous glands, bone diseases, and meningitis.

There is another aspect for which medical research is directly responsible—the greater expectation of life to which we can now look forward. The past half-century has seen something like a score of years added to our lives. Is it beyond the bounds of possibility that this figure may not be increased by the turn of the century? Eminent medical opinion has long held the view that man's normal expectation of life will even-

tually reach the hundred-year mark.

In our time the discoveries of two men, Dr. A. J. Ewins and Dr. Alexander Fleming, have been instrumental in forcing up the average age to which we may expect to live. We have to thank Dr. A. J. Ewins for the discovery of M & B 693, which has been so tremendously effective in lowering the fatality figures for pneumonia. Such is the power of the drug that the temperature of the patient is lowered and his crisis passed in a matter of hours. Whilst it would be untrue to say that the drug has completely conquered this scourge, people certainly have a much better chance of recovery from pneumonia these days.

M & B 693 is one of the sulphanilamide group—a family of drugs that are already proving themselves invaluable in tackling other health problems of the human race. In the last war a great number of wounded servicemen were protected from the advent of deadly gangrene by prompt use of a sulphanilamide. Surely it is not too much to expect that the successors of M & B 693 will put medical science in complete

control of pneumonia, dysentery, typhoid and gangrene, etc., within the next fifty years.

We have to thank Dr. Fleming for the discovery of penicillin, which, in its way, is even more miraculous than M & B 693. Scientists are hoping that, thanks to this drug, there will yet come a day when the germs of anthrax, tetanus and diphtheria will no longer have the power to kill a human being.

Possibly the most dreaded disease of the civilized world today, next to cancer, is tuberculosis. Successfully to combat this disease there will have to be not only an increase in medical knowledge, but also in social reform. We already know that the most important factors in producing a tubercular condition are inadequate nutrition and bad housing accommodation.

Early knowledge of the disease is a necessity in the fight against T.B. Fortunately, mass radiography is becoming increasingly popular and, therefore, providing doctors with an advantageous start in combating the condition as well as preventing the infected ones from spreading the disease around. Experiments are already being made

with streptomycin, an American product, and there are eminent medical research workers who believe that if T.B. can be cured by any one drug, future experiments with streptomycin will eventually provide the answer.

Finally, there remains the greatest problem of them all—knowledge of life itself. Will scientists ever solve that problem? Let us check the discoveries that have been already made in that enigmatic field. Since 1828, when Friedrich Wohler created urea, a product normally made in the body by the liver, many products of living things have been created in the laboratory.

The latest and most important success is the protein

molecule produced by Dr. Robert B. Woodward and Dr. C. H. Schramm. This places us literally on the doorstep of the knowledge that the scientists are seeking. There is every indication that the next fifty years will be sufficient for medical science to produce a man-made miracle of life.

Not the life that we recognise in human or animal form, but certainly living tissue that could revolutionise plastic surgery by permitting the renewal of flesh and muscle at the specialist's dictation, perhaps even the replacement of tired and worn-out organs. Should such an advanced stage be reached by 2000 A.D. then really breathtaking possibilities would be opened up for us.



The Adaptants were so useful that you couldn't just go ahead and kill one. You had to be clever . . .

# THIRD HAND

by *GEORGE PAUL MANN*

Someone had called them Adaptants and the name had stuck.

It described them perfectly. They were capable of adapting themselves to anything. The planet that was their home provided the real reason for this ability of course. The pressure over its surface was inconstant. Put a human being down there stripped of his space suit, and push him into travelling, and he'd explode in three paces. He just wasn't built for a world of inconstant atmospheric pressures.

The Adaptants were.

At home, on their own planet, they changed their shapes and their sizes with almost every step. They extruded hands to pull themselves over volcanic rock formations; they grew legs at will to scamper over the eternal ice of the lakes—like obscene spiders.

They extruded and withdrew arms, and legs, and hands, just when they needed them. They grew and billowed and shrank like smoke.

And yet there was flesh there. That was the uncanny thing. They were fleshed like humans. But, unlike humans, they could fit themselves into the pattern of nature as it was. They didn't have to alter things, to build bridges or make diving suits. They got along very nicely as they were. They were Adaptants.

Lessinger hadn't been with the party that opened up the planet to space flight. So he was used to the idea of their existence before he saw them. At first, like everyone else, he'd scoffed at the very notion of a form of life which was so versatile. He'd put down to space fever the newspaper stories of what that first crew

had seen. He'd said he was open-minded; that he could believe almost anything. But really!

And his wife, Molly, had acted that way too, and they'd kicked the idea around for a while, working on its most fantastic and ludicrous possibilities. They'd even laughed about it, Lessinger remembered. Hell! They'd even laughed about it! It was far from being a laughing matter now!

He looked at the instrument panel ahead with unseeing eyes. He turned and looked at Mike. And Mike just sat there and grinned at him. Nice fellow, Mike. Clean. Straight. Good-looking even, in his way. Easy to get along with. Too bad about him! Too bad that he was just that little bit too clean, too straight, too easy to get along with. Too bad that Lessinger hated his guts.

Sure! Mike was an Adaptant. *His* Adaptant!

Lessinger thought about it bitterly.

Of course, once the creatures had been shipped to Earth there was no stopping them.

They were so damned useful. They took to Earth's atmosphere like they'd been born there. Put one of them in a crowd and you'd lose him. You couldn't pick him out. Or could you? Not by looks, maybe. But certainly by something else.

Two weeks after the first shipload arrived, some character in an office chair discovered that an Adaptant could get through five times as much work as a human. Three weeks, and the space ships couldn't cover the distance to Limnos fast enough!

Thank God, thought Lessinger, thank God that the Earth's atmosphere did do *something* to them. Thank God it made them sterile. They'd have wiped out humanity if it hadn't been that way. They'd have overgrown the human population and choked it, like fungus overgrows and chokes out the life of a tree. It was something to be thankful for, even if it did leave a nasty taste in the mouth. Even if it did get you thinking really nasty ideas . . .

Six months after the first Adaptant had reached Earth

there had been a wave of strikes. There'd been labour troubles plus! Some humans had even got around to more drastic action. Like killing some of the creatures. But it was as hard as hell to kill them. Let them have one moment's forewarning of what was going to happen and they could grow out of harm's way. Yeah! Grow! The only way you could kill them successfully was to push them into fast moving machinery. Either that, or starve them to death.

Well, the first method had been tried. Some of the people on Earth didn't like being thrown out of their jobs just because some creatures from another planet could grow limbs at will. They got rough. They took the law into their own hands. They killed.

Then the State got rough too. Capital punishment had been abolished ages before. You had to turn up the phrase in an encyclopædia just to see what it meant. But the State couldn't afford to lose creatures that had been shipped half the way across Space. Not when they were as useful as

the Adaptants it couldn't. So capital punishment was re-introduced. For killing Adaptants. Go ahead. Kill as many humans as you like! At the worst you'll get a jail sentence, or maybe banishment to Mars. But kill an Adaptant—just one—and see where it gets you.

Of course the labour unions didn't take any of this lying down. They fought back as best they knew. But the answer of big business was always the same. It was always put out that the people would benefit in the end. Plenty for all was the cry. An Earth flowing with milk and honey. Uh-huh! That and the bread-line.

If only the Adaptants could figure they'd be sitting where I am now, Lessinger thought. But they hadn't got around to that yet. Just give them time. A year or two. Give them a little time to fit themselves into the picture, and then watch them go. They'll take over everything! They were well on the way to that now. They were dependable, the bosses said. They could do

things better, make things quicker, than humans.

There was Lessinger's brother. A steeple-jack. Said it was as near the space frontier as he ever wanted to be. Used to laugh about it, and call himself an Earth-man. He used to say that he was the only one in the family with his two feet on the ground.

And that's where they were right now.

Comes one morning, and he goes to the job as usual. He finds that an Adaptant has taken over. He complains to the foreman.

"Let me see *you* grow three feet, and you're back on the job!"

That's what he was told.

And it wouldn't be so bad if their versatility ended there, if all that they could do was to extrude limbs as and when required. But it was more than that. It was more than just a party trick.

They adapted themselves mentally as well. They fitted in, like mental chameleons, to the company and the surroundings in which they were placed. Women adored them. And they were sterile.

Women adored them, and you never could tell. You never could be sure.

Like Molly, for instance.

Okay, so he'd been a fool. When it all began he couldn't see the end of it. He'd thought that it would be fun to have one of these boys around. So he'd taken Mike home with him at the end of a trip. He looked normal—when he wanted to. He acted normal. He fitted himself into the family so well that you'd have thought he'd been born Molly's brother.

Or would you?

Lessinger could never be sure.

Women were queer. First off they wanted men to go out and conquer Space. They wanted their beau to be in the uniform of a space pilot. If you didn't wear that badge of the interlocking spheres you didn't get a look in anywhere. Then, after a while, women seemed to cool off a little. They weren't so keen. They said that space did things to their men-folk. That they went away happy, and came back strained and quiet. Some of the men, on the longer runs,

didn't get back for ten or twenty years. Sometimes longer than that. Lessinger thought that they were fools ever to marry. But you couldn't tell them anything, and even if you tried telling them, quite a lot of them still did.

And twenty years is a long time on Earth. Particularly in a woman's life. And when the man came back looking like he'd aged only a fortnight—because he'd swum through Time as well as Space—the women didn't think all that much of it.

Lessinger couldn't be sure. He couldn't make up his mind whether Molly's reaction, this slight cooling-off he felt in their relationship, was due to the normal tensions between a space pilot and his wife or not. Or whether it was all on account of Mike. Whether the creature had adapted himself to such good advantage that . . .

Lessinger thought about that.

He thought about it a long time. And whilst he thought his hands gripped the edges of his chair, and Mike looked on,

smiling all the while, and every now and then extruding a hand to turn a knob or re-set a switch.

They were so adaptable!

"That was my last trip," Lessinger said. He puffed out the smoke from the cigarette, and watched it spiral up to the ceiling of the room. He looked around him, taking in the soft furnishings, the comfort, the chrome steel fittings that glittered in the sun. He looked at the man behind the desk. Soft and flabby like his surroundings. He looked like he was built for comfort, too.

"I'm cashing in," he said. "I got a trifle tired of throwing myself around the universe. I've got a little money saved. I think I'll settle down and farm—after all, somebody's got to grow the stuff we eat!"

"We'll be sorry to lose you!" The man's voice was soft, too, Lessinger thought. His words rolled out like plush carpeting. You almost sank into them. "We'll be sorry to see you go. But if that's what you really want to do . . ."

The sentence ended in mid-

air. It told Lessinger what he already knew. That no one thought that he *could* settle down. That it was everyone's opinion that after all this space stuff he'd find life on Earth very tame indeed.

The way the sentence ended told him something else too. That if he wanted he could call the whole thing off here and now. He had only to stutter around a bit, say that he was fooling, that he hadn't really thought everything out, that he was still only making up his mind. Say just that, and he was still working for Spaceways. He had an out if he wanted it. If he was yellow.

The fat man said: "You'll find it very different from your work with us. It's more fatiguing. It's harder work. Oh, I know you work hard here . . ." That came out hastily; the man didn't like to give offence, even to his pilots. "I know you work hard enough in space flight, but it's a different kind of work." He tapped his forehead. Where his brains *should* be, Lessinger thought, maliciously. "It's up here that the pilot wants it. Up here. His

head. He doesn't have to pull and tear with his hands."

"I've got news for you," Lessinger said. "I won't be alone. Mike's coming with me."

"Mike! But he's one of our best!"

"Sure he's one of your best. He's going to be one of my best too. He's going to work for me. Or so he says. We've got it all figured."

The little man brightened. He was thinking that maybe it wouldn't take long to train some other creature up to Mike's standard. And whilst he was training, of course, he wouldn't be drawing as much as Mike . . .

"You should make short work of farming," he said. "You sure should make farming look sick if you've got an Adaptant!"

Lessinger took a cab from the Terminal. It was all working. It was all too easy. Next thing was to fix up the deed on the land. Get that done and he was set and ready to go. He'd have to break it to Molly, but maybe she wouldn't be sorry to see an end of

these wanderings in space. And they'd have the farm to work on. And after they'd been there for a while Mike would just disappear. One day he'd be there, and the next he'd be gone. After all, it wasn't as though he'd agreed to stay for keeps. Mike hadn't agreed to that. He'd said that he would give it a try. That was all. If it was explained to Molly, and one day Mike just wasn't around any more, it would look natural enough.

And then he'd make quite certain that he never left Molly again. And he'd never let another Adaptant within a mile of her. He'd see to that too. They'd work the farm, and maybe have some kids, and they'd live like Mike had never happened. Like none of the whole bad dream had ever happened. And maybe, sometime, the Earth Government would get a bit of sense, and the Adaptants would be sent right back where they belonged!

They could live quite safely then, with no one to trouble them. That was the way it should be.

And the plan was working.

All that was needed was that deed. He'd thought it all out. There'd be no false moves or slip-ups. Everything would go strictly according to plan.

He knew the strip he was planning to farm like the back of his hand. He'd been brought up there. He'd lived there as a boy. That made it easier to explain to Molly. He could just say that he was hankering to get back to the old places. She would believe him. He knew that she would.

And on that strip there was a disused mine-shaft. Very deep. The walls were sheer. A spider couldn't climb them. And with dynamite in the right place, and five tons of cement, nothing that lived could get out of there. Not even an Adaptant. Nothing at all!

It had to be timed carefully. Everything had to be at hand when he wanted it. But he could fix all that. He could fix it so that Mike was entombed down there. He'd starve to death. Not straight away perhaps. For a while he'd be able to live on the rats and mice that hunted around in that hole. But pretty

soon he'd get too weak to go after them, and then he'd have had it.

Lessinger thought about it. He liked the idea. It gave him a great kick. So you couldn't kill these creatures, eh? So the State wouldn't let you, no matter what they did? No matter how they disrupted your life. And you couldn't kill them because they were practically immortal. Were they? You could kill them by starving them to death, and if you hid them deep enough no one would ever know.

Man's eyes looked upwards these days. He was so busy gazing at the stars that he never got around to having the time to look at some old hole in the ground.

The scheme was fool-proof. Better than that. It was Adaptant-proof. Lessinger laughed quietly to himself.

He'd invented a word. Adaptant-proof! That was good. Very good indeed!

He was kissing her. Kisses like he'd been away a long time. The right kind of kisses for the right kind of wife. The time was now . . .

He said: "I've quit Spaceways. For good. I'm going to settle down. Farm maybe . . ." He looked at her. Holding her out from him to see how she took the news. He said: "I've had my eye on a place for quite a while."

"Do you think you could?"

She was doubtful. You could see it running through her pretty head. The same thought that bothered them all. "Are you tough enough?" was what it boiled down to, but they didn't say it like that. They were shy of putting it that way. So they looked uncertain and unsure. They looked like Molly.

"Wouldn't you like it?"

"Why yes, darling! Of course! It's just that I thought it might be too big a change for you . . . all at once . . ."

"You thought I'd got a little soft maybe?"

He was grinning at her. That was what she'd been thinking, and she hadn't wanted to say it, not until she'd known how he would react. It's one thing to think that your husband mightn't be the type to take on a rough, tough job. It's another



thing to say so. Particularly when your husband has just got back from a trip through space. You don't know with men. You don't know what space does to them. They get to thinking up there. Thinking all the time. It doesn't do them any good. Not when they can't let their thoughts go once in a while, and let them bubble over into action.

She grinned back at him. Pleased that he didn't care what she said. Pleased to see that it was like the old days again.

"You know—I thought you were a softie!"

He kept on grinning.

"I'm going to have help," he said. "Mike will be coming in this with me."

"You'll make out all right with an Adaptant around. How clever of you to fix it. You can't lose, darling! It's better than having a gang of twenty humans!"

But inside herself she wasn't thinking that at all. She was thinking that if only she knew her husband better she'd tell him what she really thought. That she didn't like Mike. That she didn't trust

him. That she only put up with him at the end of trips because she wanted her husband to be happy. Because he seemed to like having Mike around.

Then she thought, maybe, when he's settled down for a little while, maybe I'll be able to tell him then. And it won't matter so much then, because he'll be here with me, and I'll fill his life for him. He'll be so much a part of me and the farm that he won't need Mike any more. And when that happens I'll know. And I'll tell him. He'll get rid of Mike then—there'll be a dozen places just crying out for an Adaptant. And then there'll be just the two of us again. Or maybe three. Or four. Thank God my husband isn't sterile!

So she smiled at him.

She said: "You'll do fine with Mike. You see."

And inside he was laughing. Inside he was saying: "You knew all the time, didn't you, Lessinger? There was no doubt at all, was there? You knew all the time that he was Molly's lover. That you must kill him. Clever, clever, Lessinger! Clever, clever boy!"

And he felt as though he should weep.

It was a hot day. The sun shone in the sky and burned all below. Nothing moved. Even the hound dog couldn't summon up the strength to wag his tail as Lessinger walked across the porch.

Lessinger thought that this was just the day for him. Everyone would be indoors on a day like this. The heat outside was oppressive. It hit you like a slam from a heavy-weight boxer. On a day like this you wanted cool drinks in a darkened room. That suited Lessinger. The day might have been made to order.

Everything was in position. He knew exactly where everything was, and he'd even timed himself. It would take him only a matter of seconds to heave Mike over the edge. He'd stun him first. The dynamite was in place, and exactly thirty seconds after Mike had gone down Lessinger could be under cover and the mine top could be blown in. After that it would be an hour's job to get the cement into place. He could use the truck, but it

would still take some time. It shouldn't matter. Even if Mike survived the fall, even if he survived the blast, he would still be there when the cement came down. And he'd never get out of that. There was no other way out of the mine. It was a dead end shaft. It had never been anything. Mike was as good as dead and buried!

He went inside the house. Molly was resting. She looked tired and strained. He said: "Think I'll do some blasting."

"Oh, must you? Can't you just come in and laze for a while? Why don't you take it easy? You'll kill yourself, working in this sun."

"Reckon I'd better get it over and done with. Mike isn't staying with us for much longer. He said he'd fancy a change."

"I thought he was happy here?"

"So he is, but you know . . . the itch to travel . . ."

He grinned at her.

"He won't be going all that soon, surely!"

"You never know. It might be tonight. It might be to-

tomorrow. Once the urge is there . . ."

His voice tailed away, and he'd turned away from her. She could hear him calling to Mike as he went. She was glad that Mike was going. She was glad that her husband had finally got space worked out of his system, and that he no longer needed Mike around. Lately Mike had been rather . . . well . . .

Molly thought it was high time that he *did* go. She didn't feel safe when he was around. It wasn't that he'd tried to do anything . . . not yet. It was just that he looked, and you always had the idea that he was on the verge of doing something. You always had to be on your guard. And he was so damned adaptable. You got sick of it. You tried to pick a quarrel with him—tried to show him that you didn't want him. It was no good. He was so *clinging*. He fitted so well that you could never fight him. It was like trying to pick an argument with smoke. You just got sick of him.

She got up from the bed, went over to the window. She watched the truck drive out.

Her husband waved to her. Mike waved too.

She waved back. Feeling the sun heavy on her. Feeling that she was glad that Mike was going. Hoping that it would be soon.

A couple of hours after she heard the explosion her husband came home, alone. She saw that he was alone when the truck turned in at the gate, and when she saw his face she thought that something had gone wrong at the blasting. You could tell that something had happened. He looked strained.

She ran out to meet him, careless of the sun.

"Where's Mike?"

"He left, like I said he might."

"Is there anything wrong? You look worried."

"No, nothing." He screwed up a grin. He said: "It's just a relief. You know. To be on our own." He said: "I'm glad he's gone. Boy! Am I glad!"

She was happy then. She linked her arm in his. She walked back to the house with him, matching her stride with his own.

"I'm glad too," she said. "I didn't like to say this before. I didn't like to say anything in case you got mad at me. But I'm glad that he's gone. So very, very glad. It was time that we were alone. The years of space travel are dead now. We know each other again. We've got used to each other. We've adapted our lives . . ."

She laughed out loud.

"I said it—see... Adapted!" She laughed again. It was a carefree laugh, a contented laugh. "I said it!"

Lessinger laughed too.

They walked into the house together. Arm in arm. It was just like old times. Like the beginning all over again.

Lessinger was nailing up the screen when they called. The wind had caught at it during the night, and had banged it about a bit. Lessinger had heard it and Molly had heard it too. It had awakened her and he'd had to get up and tie it back so she could get some rest. Now he was fixing it so it wouldn't bang loose again.

He saw the car drive in through the gates, and wondered what they wanted. He

knew it was a police car as soon as he saw it. You couldn't mistake those new jet jobs. He thought that the police seemed to get the best of everything. Even cars!

They came stumping over to the house. There were three of them. They were looking around them as they came. They came right up onto the porch.

The old one was fat. His chin overhung his collar by a good two inches. He eyed the house. He looked Lessinger over. He spat into the dust below the porch.

"You Lessinger?"

He nodded. "What can I do for you?"

"People talk; you know how it is . . ." The old man's eyes were moving around as though he were looking for something.

"Can't we go in off the porch?"

Lessinger felt rebellious. For some reason he just felt cussed. He was sick of being polite to the police.

"I like it here!"

"Just as you say . . ."

"What are people talking about?"

The old man looked unhappy. He fixed his eyes over on the gate. He said: "They reckon that your hired help left too quick. Specially as no one saw him go, and no one's seen him since."

"So?"

"So we just thought that we'd take a run out, and see what you'd got to say..."

Molly came out onto the porch then.

The old man smiled at her, a wary smile. "We're just visiting, ma'am."

"Just snooping, you mean!" Lessinger said. He turned to Molly. "They're saying that there's something strange in the way Mike left. It was too quick they say. The cops like notice these days before a man makes up his mind!"

Molly looked surprised. She said: "But he'd been talking about going for some time. You don't think... you don't mean..."

She stopped. The old man's face got red. He said: "We have to investigate ma'am. You know the law. We don't like to think of one of these Adaptants getting hurt."

"But why should we hurt

him? He was my husband's friend."

The old one squirmed a little, and his face got redder. "You know what people are. They get to saying all kinds of things."

"What kind of things? Oh—I see... you mean that he was my lover?"

"Well, yes, in a manner of speaking..."

"That my husband killed him in a fit of jealousy?"

"Yes..."

And Molly laughed. She laughed out loud. She said: "Does it look like it to you? Does my husband look like a man who's got a killing on his conscience? Do you think I'd live with him if it was true? Do I look like a woman who'd sell out her husband, and then sell out her lover?"

"No."

"But you've got to investigate. Is that it? Well, bring on your bloodhounds. Turn the place upside down. You won't find anything. There isn't anything to find."

"It isn't that we take the people seriously, ma'am. It's just that there was so much talk. And him going off with-

out anyone seeing him . . ."

His voice tailed away uncomfortably. He said: "I can see that there's nothing in the story. I think we'll be getting along."

He moved off the porch. He walked to the car. Halfway there one of the other policemen pointed out the path that led across the meadow to the mine shaft. He called back to the house: "Mind if we take a look down here?"

Lessinger was balanced on the stool, his hammer still in his hand. If they went down there, and saw the fresh cement, they'd be sure to ask questions . . .

He gathered himself to shout back. Yes he did mind.

The stool rocked. He felt himself slip. The stool slid beneath him.

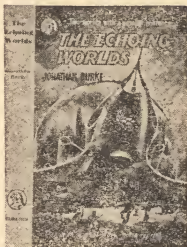
Molly saw it.

"Look out, darling!"

He was slipping. And then the warning was changed to a scream. The police began to pound back towards the house.

He looked down dazedly. He still held the hammer in his hand. He held a nail in the other. With the third he was holding on to the shutter.

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*The Editor does not necessarily agree with all the views expounded in this article—only some of them!*

# On Writing Science Fiction

by BRIAN W. ALDISS

The usual and best advice to a potential author is "Study the great writers," and it holds good for a science fiction author too. Fielding or Conrad are splendid foundations for anybody's style. Addison's *Essays* may be of more help than Einstein's special theory. If this sounds too like a counsel of perfection, remember that every word we use has already been used over and over again, and a word, like an old penny, gets its edge worn off and the symbol that it bears becomes defaced. The most brilliant plot is not enough—there is also an emotion to be conveyed, and the tried and true way of doing that is sentence arrangement—construction. Yes, grammar! You can no more write without a firm grip of syntax than you

can build a skyscraper without a steel skeleton.

The science fiction writer could do worse than read Defoe. Defoe had several aims in common with sciencefiction—to give a feeling of reality to a vision, to give an "eyewitness" quality to something never experienced. Read his *Journal of the Plague Year*—it is a most enthralling account (and you can get it for 5s. in the Everyman edition).

Yet, having said that, there remains something else—pace. It is a modern requirement and you will not learn it from Henry James. Instead, try a subscription—should I suggest it, even in the broad-minded columns of *Authentic?*—to *Astounding*. There you can see the fast bowlers of science fiction in action, as efficient as the machines they

describe. Heinlein, Lewis Padgett, Philip K. Dick, Alan Nourse and Murray Leinster are all masters of pace. What they say, goes—smooth and rapid.

This is to suggest only a leaf out of the American book, not a hogging of the whole volume. Let's be modest, but if "I quitted the room" sounds American, it was employed in *The Castle of Otranto*, written in 1754. Lend-lease is still required in language, and science fiction should be as international as possible. But the British have a way of their own too, and you should hear Cockney as well as Brooklynese on Mercury. If *our* writers don't acknowledge that, you can't expect anybody else to. Now that there is a number of British science fiction magazines, we ought to be able to make a real contribution of our own to the field, apart from the few bright lights that we already have. For the sort of thing I mean, see John Carnell's anthologies, *No Place Like Earth* and the new *Gateways to Tomorrow*. Or

for one concrete example of excellence, re-read Eric Charles Maine's *Highway 1*, which *Authentic* recently published. The idea of a man riding into the future on an ordinary push bike was both charming and memorable. But then—it was skilfully written.

A science fiction writer draws his inspiration not from holy writ or past history or everyday life, as have the illustrious dead, but from the problems and technologies of the present, often extending them to the *nth* power into the future. Let his writing prove up to the challenge—remember, a split infinitive offends some readers, and a floating clause sinks others. It is lack of attention to such details that shakes the faith of a reader in the wisdom of an author. And, of course, there is nothing wrong with perfection, provided you remember that even a perfect story will have its detractors. As Dryden said, comparing writers and critics:

*To see this fondness and that spite,*



*You'd think that none but madmen judge or write.*

Demands of style apart, what a happy field science fiction is for any writer! No love interest, that dead weight of popular fiction, is necessary; stories may end in a bang or a whimper; settings can range from Southend to Sirius; characters may be men, mice or Martians and have as many hands or feet as required. Any subject is potential material, from toothache to tarantulas, provided the approach is fresh and original. And the approach may be not only scientific but documentary (*vide* Hal Clement), sociological (Poul Anderson), ironical (Alan Nelson), poetical (Sturgeon), whimsical (Ray Bradbury), amorous (McIntosh) or plain

funny (Fredric Brown), etc. The sky is no longer the limit.

The science fiction universe is finite but boundless—and it's expanding! The best description of science fiction I know is "The Twentieth Century Morality." Since pre-war, its range has extended from "the machine" to "man and the machine," and the gain—in entertainment, prestige and sales-value—has been enormous. To your pens, *mes enfants!*

Who am I to offer advice, and why? Well, one can only recommend one's own method. Just how good is that method? There you have me—*Authentic* has refused every story I have offered them.

Fellow sufferers, you are not alone!

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## SAVIOUR

is the title of next month's feature story by Bryan Berry. Other stories include *The Higher Mathematics* by M. C. Woodhouse, *Psychic Twin* by Dan Morgan and *The Merchants* by D. R. Davies. Features include *The Hydrogen Bomb*, *The Expanding Universe*, *Robots* and several more.

**AUTHENTIC — A MONTHLY MUST**

*There are more ways than one of a world coming  
to an end—or a beginning*



# Dimensional Destiny

*by*

GRAHAM WINSLOW

Naxos leapt out of the Central Transportation exit. Swiftly, he turned into the Express Boulevard; within three minutes he had entered Dimensional Security H.Q. Ignoring the office staff, he rushed down the middle aisle of outer reception; without a pause he burst into the Chief Executive's inner and private room.

This official half-rose from his chair . . . a protest on his lips; he subsided, realising the identity of his visitor. "What's the trouble, Naxos? I wasn't expecting you for another three days . . ."

"Listen carefully, Ekrill," Naxos interrupted. "There isn't a moment to lose. A Class One emergency is imminent, but I doubt if the operators on extended beam will realise the significance of

the danger; they're almost certain to report a Class Three at the most. My earnest request is that *you* indicate the greater danger."

"How is that possible?" the Executive queried. "Give me details; you know what would happen if I imposed a Class One and it turned out to be only a three-grading after all. Come, Naxos, you're excited—a reaction after being so long in charge of the Zenkal Perimeter Union."

Naxos leaned back and looked straight at Ekrill, remarking: "Have you ever known me to over-estimate a dimensional danger?"

Ekrill fidgeted in his chair. "This is different, Naxos. Things have changed lately. I admit we're having trouble in all the perimeter sectors, probably boiling up for a

Class One, but not at once; only pin-pricks, although they keep the emergency squads on their toes."

"Exactly," Naxos answered. "That's just the point, everything is boiling up, and soon we'll be faced by unusual hazards in the extra-dimensional border zones. If we're not fully prepared we shall lose many of the perimeter galaxies, and you know how the Supreme Council will react if that happens."

The Chief rose to his feet and strode irresolutely about the room. Abruptly, he stopped and spoke quietly: "It can't be done, Naxos; I've told you the emergency squads are available continuously..."

"Yes, yes, Ekrill," Naxos broke in. "I understand all that, but under Class Three there's not the same co-ordination . . . it's . . . strictly localised direction."

Ekrill nodded his head. "Isn't that better than interference from higher up? Surely, Naxos, you're the last person to advocate top-level direction when the perimeter sections can cope?"

The official from Zenkal looked uncomfortable. Ekrill eyed him with interest, thinking: What a fine person Naxos is; recently, one of our finest

perimeter administrators, an expert dimensional scientist. He looks worried, his keen grey eyes have lost their usual sparkle, and there are extra furrowed lines on his forehead, but he still possesses his regal bearing, handsome face, perfect physique and, above all, a gentle dignity.

Naxos turned to go, hesitated, and then leaned forward over the desk. "I'd like to speak as a friend, an unofficial chat."

"Certainly, Naxos. I'm puzzled as to the way you're acting; it's not like you."

"Perhaps not. This is off the record . . . it conflicts with all known data and I, as a dimensional scientist, cannot, for the moment, understand it. There's fear in my heart."

"Surely, not afraid . . . not you, Naxos?"

"Yes, it's true, but hear me out; then, maybe you'll understand too. You are familiar with routine perimeter activities; how we're bounded by the dimensional frontier, discovered when the old astronomers believed that the 3D universe was infinite. Later, the dimensional boundary, billions of light years from the inner galaxies, was discovered."

Ekrill, rather testily: "I know all that. Wait! Refresh-

ment is needed to see us through, and I must give instructions that I'm *not* available for interviews for the present."

Naxos was impatient, but thankful that Ekrill had agreed to hear his story, although he felt that the older man would believe him to be mentally unbalanced, the aftermath of long tours of duty in perimeter zones. He resumed: "Later, we were able to solve the problem of spatial travel in terms of dimensional physics. Actually, spatial travel became a mis-nomer; it was dimension travel pure and simple. We could visit various levels. Eventually we found there was a limit. We couldn't solve the riddle of the barrier. A matter of going so far and then . . . *a full stop!*

"Up to very recently we've experienced no difficulty in travelling through the levels to the barrier, but during the past year I, at least, have hit on something different."

"Why didn't you report it?"

"It wasn't anything definite, Ekrill; the department would have rejected it with the official stamp: *insufficient data*—the only way I can explain it is by recounting a personal journey from my own zonal level in Zenkal. I'd planned to

translate from 3D to 5D so that I could discuss certain difficulties, purely admin., with a wily old character, the Bandlittero of Gless. *But for almost a week I couldn't reach him!* I landed all over the place except in Gless—I doubt if a translation was made beyond 4D."

"Surely, it was a technical fault?"

Naxos sighed. "I don't think so. At first that was my own assumption. Several check-ups showed that all the channel devices were functioning perfectly. Not a flaw anywhere. We switched over to duplicate channels and still I was unable to reach the Bandlittero. I was about to give up. Suddenly all became normal again; I pushed through to the old chief and finished my business."

"Then why worry any further?" Ekrill demanded.

"Because we ran into more trouble. Only a few days later, a trade matter with that stupid Regent of Pignol in 4D. It was only a one-step journey and we couldn't make it. Everything acted dead as far as a move from 3 to 4D was concerned; nothing seemed amiss. There's number one—couldn't reach 5D, at least I think not, or a part of it

wasn't available as a destination point. Only a short time afterwards we couldn't make the simple hop into 4D. Almost a week passed before normalcy returned. I saw Regent Temmlad and everything appeared to be satisfactory, except that I was worried, *very worried*."

"There must have been an instrumental fault," Ekrill suggested.

"Remotely possible," Naxos agreed. "Remember, I've got one of the finest teams from maintenance and you know how efficient our latest model translation units are, and I checked all myself. No! There must be an evolutionary change. If the trouble spreads, many of our perimeter departments will be trapped. Dimensional travel may, without warning, disappear completely and whole galaxies will be cut off one from another."

The Chief rubbed his chin as he poured out more drinks. He sipped, appreciatively, from his goblet. Placing it back carefully on the desk he gazed at it as though it might be an ancient crystal ball which would show, in picture form, that which he sought . . . a right decision. He spoke to his colleague: "I'm glad that

you've seen fit to tell me this, Naxos. You'll realise that I'm unable to do much about the matter at present, but I'll bear in mind all you've told me, and now, it's very necessary that you make the most of the free time allotted to you. I'm sure that your wife, Kleria, will be anxious to have you to herself for a while. I may have to communicate with you sooner than I'd wish, but be off with you."

"Thanks, Ekrill. Your kindness is appreciated. My farewell."

"Farewell," echoed Ekrill in the traditional manner.

Kleria had everything prepared for Naxos, and a greeting which had come down the ages: "You're late, my dear Naxos."

"Yes, Kleria, although Ekrill found me three days early, but you had my special message; I should have told Ekrill too. It was my indecision as to what I should tell him . . ."

"The usual report?"

"Not quite." Naxos repeated his story, causing Kleria's beautiful and classical features to appear puzzled, but she was well able to discuss the problem, having been a dimensional physics professor.

"In simple terms, dear Naxos, you feel that the whole dimensional series is showing signs of 'growing pains'—that we may well have a substantial change in the *type* of dimensional energy with which we are familiar."

"Something like that, Kleria. I can only assume such things; we mustn't rule out the possibility that we're being attacked. I fear that when the higher authority begins to take notice they will, alas, conclude this to be so, rather than a fundamental change."

Kleria thought a while. "Suppose we consider Meldrith's Arcana of Dimensional Physics. Carrying on from the ancient dictum: 'As above, so below'—he developed his multi-dimensional concept, that change in our 3D universe, entropy, etc., was the result of an interchange of energy—*energy of degree* being a key factor in his theory.

"Higher levels of energy enclosing the lower ones. Levels being defined by their energy content, not forgetting that evolution towards a closer-knit unity was, and still is, the *movement*. *All is motion*; motion of degree—unity of degree! This meant an inevitable progression and changes—in the sub-levels.

The *relative* chaos would diminish and increase its reality of correspondence with the higher and enclosing force patterns."

Naxos nodded his head. "Yes, Kleria, Meldrith had a remarkable insight into the bases of dimensional energy, and later on Blathwayne . . ."

Kleria interrupted: "Enough 'shop' for now. We *should* make the most of this leisure."

The next morning Naxos and Kleria moved lazily; their morning meal barely ended when the viewcator buzzed. It was Ekrill. His serious face came on the screen: "Naxos! Sorry, I must ask you to report here; many of the outer areas can't be located on the probing scopes. I fear that something big is on the way. I've ordered a Class One . . . that was five minutes ago. Better to bring Kleria too. We'll need all the brains we can muster."

"Very well, Ekrill; leaving here at once."

He and Kleria reached H.Q. within minutes.

"You were right, Naxos!" greeted Ekrill. "I'm glad you're here too, Kleria. This is the worst dimensional trouble we've had in years. Your own

sector has already gone, Naxos, and I'm sorry to have this news for you . . . I realise how many years you worked with that wonderful team of yours."

An air of great sadness came upon Naxos; then, quite suddenly, he squared his shoulders and a grim look came on his face. Before he could reply the emergency line of communication with the Council flashed for attention. Rendlow, the Supreme Minister, looked very serious. "Citizens, we feel that an attack has been launched against us. Intelligence indicates that this comes from 5D."

Kleria looked meaningly at Naxos. She noted the tight lines round his mouth.

The Minister continued: "All emergency measures are operative under Class One *plus*, which means the manning of the BZ-ray *ready for attack if necessary*. Appoint, at once, integrator officials for the closest possible liaison. Continuous reports are to be given. That is all."

As the Minister's face faded Ekrill bustled about his desk pushing buttons as though his life depended upon it, and probably that was true. He jerked his head: "Naxos, Kleria, I'm appointing both

of you as integration officers. Take over in control five."

The control room (5) was equipped with every possible instrument. Kleria's eyes sparkled with excitement. "Some of this you must explain, Naxos. I'm a little behind the times."

"That will not be difficult . . . mostly refinements. These detectors can trace dimensional frontiers with uncanny accuracy and show faults in the energy patterns. I'll demonstrate the fault we'll find near my own sector . . . or what *was* my sector."

The detectors flickered and the scopic amplifiers hummed, but the long-range viewcators adapted for pattern readings in the output channels only presented coherent lines on the beaming field; the resultant receptics were chaotic.

"That's it," Naxos exclaimed. "No formulation of the basic return frequency which should be there. All we have is the fundamental flicker of the probing transmission. We'll have to search the perimeter and plot those which are still existent and amend our charts."

They worked many hours, reporting every thirty minutes. Eventually, they had a fairly complete picture . . . one of

disaster adding up to *nothing*. Nothing of that which had existed on the evening before. Dozens of the outer galaxies could not be detected. Reduced probe range found the edge of the 3D universe. It was *unstable*.

Orders came through to the emergency squads: "Switch on BZ-rays for attack beaming; sweep all perimeters."

Naxos turned to Kleria: "I don't like this; they're assuming too much. Why should they believe that this disaster is a 5D attack? I'm almost positive it's an evolutionary change—one that may manifest but once in billions of years."

Kleria brushed her golden hair to one side and grasped her husband's arm. Eagerly she spoke: "Something like a tidal wave of extra-dimensional energy coming from the barrier itself—being the ultimate for our series of energy levels."

"Bright girl, very near the mark," Naxos answered. "I must talk with Rendlow. If they continue in this fashion they'll upset the dimensional structure still further. Remember Meldrith's exposition on the *Law of Reversal*—increase the destructive powers of the

BZ units and, under circumstances such as these, the destroying energy will be *helped* . . . not hindered!"

Kleria's thoughts raced madly through her mind—so much so she could not find words to answer; by the time she turned to speak Naxos had left the room.

Rendlow greeted Naxos and bade him state his case. For the third time the story was told. Rendlow cleared his throat: "Very interesting, but I've many reports from Intelligence supporting our belief, that we're faced with an attack from 5D—probably the Weldrogs. Their dimensional science is vast; greater than our own, but they are, in the main, theorists rather than practical operators. They have viewed with some distaste our own advances. We feel that they are trying to blot us out."

"I don't think so, Rendlow; the Weldrogs are not unknown to me. I've travelled extensively in the various dimensions. As you know, I'm a scientist and have studied the energy patterns for more years than I care to contemplate. It's my considered opinion that we are faced with a natural upheaval—a dimensional cataclysm. Con-



tinued use of the BZ units will induce *supporting* patterns. The *attack* policy is wrong."

The Minister frowned. "Aren't you theorising too much? If we stop using BZ attack what else is there to do? Supposing your theory is correct, how could we protect ourselves?"

"That's impossible!"

"To protect ourselves?"

"Yes, Rendlow. We should *remove* ourselves while we can . . . to the 4D central area—I believe that will remain stable, but time is short."

Rendlow lost his self control. "Naxos, you must be crazy to suggest that we abandon 3D without a struggle—after all we've gained since our history began."

"I know it sounds so, but I've given my opinion; submit it to the Council—at least do that."

Rendlow reluctantly agreed.

Slowly, Naxos returned to the control room and reluctantly met Kleria's questioning blue eyes. "I've failed to convince him. It was my wish that we should abandon 3D and move to 4D Central."

Kleria was shocked, but she remained calm and comforted Naxos with an impulsive embrace; she broke away, smiling, and urged him to sit down and

relax for a few minutes. There was weariness in his voice. "Rendlow is putting it to the Council; I know what they'll answer: 'He's crazy!' They imagine that I don't know what I'm talking about. It seems that they're convinced that Intelligence is one hundred per cent. correct . . . so, BZ will continue and, in turn, bolster up the flow of this invading energy."

"Don't anticipate so, my dear," Kleria urged.

A few minutes later Rendlow contacted Naxos: "The Council cannot accept your report. BZ attack is to be increased to maximum power at once."

Naxos and Kleria were relieved after twelve hours of hard work. Immediately, they went to see Ekrill, so that they might receive more news of the overall operation.

Ekrill gave them a curt nod. It was obvious that he was over-tired and anxious.

"What news now, Ekrill?" Kleria asked.

"Very bad indeed; the force has increased its speed tenfold during the last few hours and it's still increasing. We can't control it, nor does it follow known laws. The encroachment comes from *all* directions.

The BZ-rays are useless; perhaps they've made matters worse. There's a steep curve of cumulative progress insofar as the energy itself is concerned. *All* dimensional travel has gone crazy. Regular channels ceased to operate hours ago and those in the present, but ever-disappearing fringe galaxies, are endeavouring to escape in this direction... in old museum pieces, the one-time spaceships; but they're not fast enough. The galaxies are being destroyed at an alarming rate. Commando emergency squads have been annihilated and there seems nothing left to do . . . except, perhaps . . . *to pray!*"

Naxos was terse: "If only the Council had taken heed of my advice."

"Don't be bitter," soothed Kleria. "Let's go home and rest."

There was a brief but sincere leave taking; they left Ekrill dejected, awaiting the arrival of his relief.

Naxos and Kleria reported for their next tour of duty, finding the observable 3D universe very much reduced in size. The speed of the destroying energy was now greatly in excess of light. Peculiar effects were occurring, but before they could investigate there

came a special announcement from Rendlow; it was devoid of all frills: "Our science is unable to cope with the situation. We cannot be sure that the 3D universe is non-existent beyond the curtain of approaching energy, but it would seem to be true. Dimensional travel is non-operative due to fundamental changes in the force patterns which have, hitherto, been amenable to our control. We are cut off from the extra-dimensional states. The 3D universe is shrinking at a speed beyond our imagining.

"We can only bow our heads to a Higher Power: we are helpless. Every possible measure has been tried, but these seem to aggravate the situation, attracting the energy as though we were a magnet beckoning an iron filing.

"Before I bid you farewell, allow me to give credit to Naxos, recently a Chief Official on perimeter duties in the Zenkal Zone. Naxos foresaw this danger and urged us to take heed, though our Intelligence reports seemed to suggest that a 5D governing body was bent on attacking us. This we can no longer consider as being true. Naxos was right; at one time it might have been possible for some of

us to escape into the 4D realms. Now, owing to the collapse of the translation devices, it is impossible.

"The Council feels that everyone be left to his or her own devices—the automatic services may function a little longer. In the name of the Council, I, Rendlow, bid you all farewell, and may your remaining hours hold some happiness in the company of your loved ones . . . *farewell!*"

Rendlow's voice almost broke as he ended his speech. His serious countenance faded from the many screens and officials began to make their way, very quietly, to their homes. Hurried good-byes were made and Ekrill took leave of Naxos and Kleria.

"Kleria, let's not go home," Naxos said.

"Why not?"

"It would please me to make a short journey—to Meldrith's Mausoleum and the Dimensional Museum, as we did so often in our young days."

"All right," agreed Kleria. "So long as we are together it doesn't matter any more where we are."

Arm in arm they browsed round the various exhibits, occasionally commenting on their merits or demerits. They

tired of this and went outside to rest in a beautiful wooded glade. They thought, nostalgically, about the past—deliberately not mentioning the subject which was really uppermost in their minds. Kleria spoke: "Perhaps we should go home, Naxos, and await the end there."

"Yes, I suppose so, although I hate to leave this lovely spot," he answered.

At the moment when they rose to leave a loud clap of thunder shook the trees. Heavy clouds piled up overhead and a sharp breeze smote their faces. They ran to the building for shelter.

A storm of tropical intensity broke out—such a storm as the earth had not seen for centuries. The couple showed no fear; their scientific training allowed them to view with more than a passing interest the display of nature's unleashed energy. They were stirred and excited by an hitherto unknown spectacle. Their faces, intense, yet calm, gazed at the constant flashes which illumined the premature darkness. The gardens were whipped about by the slashing gusts and rain flew in all directions—beating like demon tom-toms against the building.

A singularly vicious flash caught the roof of the museum, splitting it apart. The deluge poured into the upper rooms.

"Not so safe here, Kleria—better if we move into the mausoleum. A grim thought I know, but it's a much stronger place." Naxos had to shout in order to make himself heard above the tumult, but his wife grasped his meaning, and she nodded.

They passed along a service corridor connecting the two buildings. There were no locked doors; crime unknown, the geneticists had seen to that; the race was stable and intelligent. A golden age of sorts, though no one claimed that mankind had reached an apex of development, otherwise he would not now be at the mercy of the dimensional cataclysm.

Once inside the mausoleum they huddled together for warmth. Without the stabilised weather they felt the cold. The only illumination came from the phosphorescent decorations which had long surrounded the catafalque-type of tomb. The last resting place of the famous Meldrith's earthly remains—the scientist-philosopher who had made possible the present advanced understanding of modern di-

dimensional physics. It seemed ironical that nature's *uncontrolled* energies would sweep all this to one side; here was the strongest building in the district.

The noise was deafening. Naxos and Kleria embraced, shouting loving farewells. They huddled still closer . . . awaiting the end . . .

The mausoleum shook, wavered, seeming to melt away like grease struck by intense heat. There was a flash of brilliant light . . . the strident noises ceased abruptly . . .!

Naxos blinked. He looked at Kleria; she smiled; he grinned, reached out and pulled her to him. Then, very tenderly, he kissed her on the lips.

Simultaneously they sprang to their feet, realising that the storm had passed, *that all was calm . . . that they were still alive!*

They gazed round, unbelievably. The mausoleum was there . . . *intact*, but somehow different. They ran into the corridor and along into the museum, finding everything restored to normal—yet with a curious change. All had an air of enhancement. Outside they went, staring round in the park; all was

peace. Not one single sign of the storm; no wreckage or destruction. Overhead a splendid cloudless sky . . . birds whistled unceasingly . . . the wondrous coloured flowers gave unstintingly of their subtle perfumes.

"I've an idea, Kleria."

"It's like 4D," she said.

"Yes, I . . ." Naxos broke off.

They saw a crowd of people coming towards them; in the lead, Rendlow and Ekrill.

Rendlow spoke: "Our sincere greetings, Naxos and Kleria. We come to do homage at the tomb of the great Meldrith, so that we may thank the Cosmic Power for our deliverance . . . I daresay you wonder what has happened, especially after the turmoil?"

"Indeed we do," Naxos answered. "All this," he waved his arms, "reminds me of 4D."

"Very near the mark; both of you know that the barrier existed beyond 7D; we now know that it has moved to a state beyond 8D, and this, *it is*

*a new 4D*. What was 4D has become 5D and so on."

"But how do you *know* all this?" Kleria asked.

"A most illustrious visitor came among us . . . *a Great One from the formless levels in the new 8D*. Whilst in our midst he took on the form of one most wonderful to behold. He explained: 'The 3D universe, existent in the way you knew, has ceased to serve its purpose. Evolutionary laws demanded that it should vanish and the lower scale of manifestation become this sublimated 3D . . . *a new 4D*. The opportunities for *all* beings, including human kind, remain . . . *multi-dimensional*.' That is the gist of the information, and how tremendous it is . . . words cannot express."

Naxos and Kleria joined the group and entered the mausoleum. Radiant colours played around the tomb . . . Kleria whispered to Rendlow: "Who was the Great Being from the new 8D?"

The Minister smiled: "Meldrith!"

# THE ATOMIC SUBMARINE

THE WORLD'S FIRST operational atomic submarine was launched on January 1st this year by the U.S. Navy, only twenty months after its keel was laid and only eight years after the first release of atomic energy at Alamogordo. Such remarkable progress is in large measure attributable to the pertinacity of Admiral H. G. Rickover, who risked his career by championing the feasibility of an atomic submarine. Against a great deal of opposition—based on grounds of economy and sheer prejudice—Rickover swayed the opinions of the powers that be and was granted permission to build a prototype atomic engine. When it became apparent that Rickover was right, the keel was laid and work went ahead at the naval interpretation of "full speed"—which was pretty fast.

Externally, the atomic submarine looks like any other heavy-weight underwater craft. The atomotor has been incorporated into a fairly normal hull. It is called the Submarine Thermal Reactor because it is specifically designed to function with thermal neutrons. Uranium enriched in U235 forms a

core to the reactor, which tends to get incredibly hot. Cooling is accomplished by a wide bath of very pure water surrounding the reactor, and this bath also acts as a moderator of the reactor's pace.

Most of the heat produced in the reactor is what is wanted, of course. It is removed from the reactor by a fairly orthodox type of heat-exchanger and fed from thence to a boiler, where it turns water into steam. The steam is fed in the usual way to turbines and the revolving wheels turn the propeller shafts. Thus, the atomic submarine is really a steam submarine! But with a difference.

The great difference, the difference that makes the whole project economically worth while, is that the atomic submarine needs no oxygen in the processes of its steam generation.

All other submarines—and surface ships, too, of course—must have oxygen either directly or indirectly, to run their engines. When the normal submarine is under water its engines run on batteries. But the batteries can only be recharged by running the diesel engines, and that re-

quires oxygen. Tremendous advances have been made in "breathing" devices such as the Schnorkel tube which feeds atmospheric oxygen to the diesel engines when the craft is under water. Recently a British submarine made a trip to Britain all the way from the Bahamas without once surfacing. But that was about the limit.

The other big difference between the atomic submarine and vessels of the more normal type, is that the former will need refuelling only at extremely rare intervals—the actual period is still a secret. Once again, coming to the surface is obviated almost entirely.

The atomic submarine represents a *real* submarine for the first time in military history. Normal submarines are more like the underwater swimmer who *has* to come up for air and food. The atomic submarine is more like a fish. The comparatively small amount of uranium fuel will go on producing heat for considerable periods, and the propellers will continue to turn all that time. Since the oxygen and food requirements of the crew are small in relation to the devourments of engines, enough of them

can be packed aboard to last the men for the whole several-times-around-the-world trip. The atomic submarine is virtually self-contained; a miniature world beneath the waves. Indeed, crew endurance is its only limiting factor.

So once again man has built a machine that could function perfectly if only man himself could do so. One begins to wonder about the atomic submarine's potentialities when crewed by robots . . .

And the operational capabilities of the atomic submarine are far in excess of normal underwater vessels. It can outpace a destroyer travelling at twenty-five to thirty knots. Cruising along comfortably at much greater depths than ordinary submarines can reach, the atomic craft could slip under a convoy's defences, release its deadly "tinfish" and speed away again in a fashion that would make the defending destroyers look rather silly. In fact, they would not be destroyers any more, in the original sense of the term. Thus, the mere advent of the atomic submarine necessitates a drastic improvement in existing anti-submarine methods and vessels.

And, for the first time, the atomic submarine makes it possible to use underwater craft for more extensive operations than mere torpedoing of ships. Guided missile equipment mounted on the decks makes it a formidable weapon of *land* attack. It could easily cross the vastest ocean undetected, surface near an enemy shore, pound the coastal and inland installations, and then retreat to the dark concealment of its abyssal lair. If those missiles took the form of atomic rockets, and they probably would, the atomic submarine becomes a major weapon. 'Planes carrying atomic bombs can be seen and shot down. With submarines it is not so easy. The vessel could surface off, say, Sheerness, and lob its missiles onto London almost before we were aware of its existence.

All that presupposes that anti-submarine devices remain as they are at present—which is most unlikely, to say the least. For our survival we must introduce new methods of detection and destruction. The price is far greater than in the past. The necessity to counteract the magnetic mine, for example, was not nearly

so pressing. Without such counteraction, we would have lost a few more ships and gone without a bit more food. But if we don't counteract the atomic submarine, the whole of London may be destroyed!

All this can be said about *Nautilus*, the very first atomic submarine. What can be said about *Sea Wolf*, the second one that is now being built, incorporating improvements in design and performance learnt from the work on *Nautilus*? *Sea Wolf* will have a reactor that runs on medium-speed neutrons, and will have a moderator bath of molten sodium. And what can be said of the submarines of the remote future that will differ from *Nautilus* and *Sea Wolf* as much as the Comet differs from the old open-cockpit biplanes?

Naval authorities believe that a whole new era of sea warfare has been opened up by the successful development of the atomic submarine. It may be that, in the long run, surface ships will become entirely obsolete as weapons of war. One can envisage enormous submarines that can carry great numbers of troops—to advance stealthily in the depths of the oceans,



unseen, undestroyable, to disgorge the fighting men on the shores of the enemy. There can be no doubt that shifting an army underwater would be a considerably easier task than doing the same thing on the surface. Imagine the invasion of North Africa, of Normandy, of Greece, carried out with submarines. How easy it would be! Provided there were no good measures of countering the menace. This opens up another line of thought. Is it a good thing for humanity in general that counter-measures will be devised? Superficially, it would seem that the answer in an unequivocal affirmative. But let us look deeper.

The battles of nations have often been compared to the battles of chess-players, and the analogy has many points of advantage. Nations and chess-players seem to be inately belligerent. No nation can be excused from this statement, for all nations have at one time or another been belligerent; and all nations give first thought to forceful settlement of disputes—why else are there armies coexistent with preachings of disarmament desires? And all chess-players are characterised by the desire to have a

game and beat their opponents. What stops them?

Probably nothing. But they *tend* not to play games with opponents who they know they cannot beat. The game loses its point when the end is foreknown. Perhaps—and we say this guardedly because so many factors are involved in all human relations—perhaps, if weapons of war could be devised such that there was no possibility of countering them, and if all nations possessed those weapons, there would be an end to war.

It is a fond hope that man will change his nature and outlaw wars by using his intellect. That is also, apparently, a futile hope. It may be that man will have to outlaw wars even though his nature is still belligerent. If all nations possess tremendously potential weapons against which there is no defence, going to war would be even more lunatic than it is today. Some people thought that there would be no defence against the atomic bomb, but this is not really so. It could be that the less sensational atomic submarine has a far greater potentiality for both war and peace than

anything else man has ever devised.

Not now, maybe. Not in these early stages. But later on, when the atomic submarine becomes dominant over all other naval vessels, when its threat is huge and its counteraction impossible—then, maybe, man will throw in the sponge for the last time. It is a truism and a paradox that the most perfect weapon of war is also the most perfect defender of peace. That is because man, as well as being fundamentally belligerent, fears death individually, nationally and racially.

It is doubtful whether Admiral Rickover had such thoughts when he pushed forward the atomic submarine programme against heavy opposition. Militarists are no doubt swayed by the very highest motivations—but these for them are nationalistic, not humanitarian. The militarist's job is to protect his country by means of attack and means of defence. It is part of their nature, temperament and profession to regard war as something that will always threaten the world. It is not their job to find ways of preventing wars,

but only ways of winning them.

And Admiral Rickover, by military standards, did a magnificent job when he made the atomic submarine a reality. What we are saying here is that posterity may show that, by humanitarian standards, he also did more than any other man the world has ever known to bring an end to wars.

Numerous Nobel Peace Prizes have been given to theorists whose thoughts have resulted in greater human understanding, at least on paper. The Nobel Prize committee would probably never even consider the award of a Peace Prize to a man whose life and efforts are bound up with the paraphernalia of war. Yet future history may show that the recipients of those Prizes had a completely negligible effect on the establishment of lasting peace, and that it was the militarists who, unwittingly perhaps, forced the world to abandon the irrational savagery of armed conflict.

We have extrapolated a long way from the launching of the first atomic submarine. We may be entirely wrong. But we hope we are not.

# Logic is Fun

by FRANK WILSON, B.Sc.

THIS IS THE FIRST of a series of articles I am writing especially for *Authentic*—because so many readers showed a keen interest in logic when writing to the Editor about John Christopher's story *Aristotle*. Logic is, of course, an essential part of science, and many science fiction stories have been concerned with logical problems. So we shall see in this series what logic is all about, and will at the same time take a look at the logical basis of scientific method—for science, you know, is really method, irrespective of what the method is applied to.

Now, like all good scientists, we shall have to define our terms. That way you will know what I am talking about and will not run the risk of misinterpreting me. But first, let us consider just what *is* a scientific definition. Well, we could talk around this question for a long time, but we'll go straight to the point and define a definition!

A scientific—i.e. logical—

definition is a phrase which states the class and the distinguishing features of the thing defined. There you are then; when you define a thing, which need not be material or actual, you say what class it belongs to and then say what distinguishes it from the other members of that class. For example, we can define "rocketship" as "a vehicle designed for space travel." Here the word "vehicle" tells us what class of thing a rocketship is, and the rest of the definition enables us to tell the difference between a rocketship and all other vehicles such as buses, boats and bamboo litters. We'll have more to say about definition some other time, but for the moment let's push on.

We are going to have a look at logic. All right. What is logic? How is it defined? Like this: Logic is the science which examines the principles and methods of valid thought, and which seeks to secure consistency between thought and

the real nature of the things thought about. That should be clear enough.

So we can see that logic can be divided into two parts—one, that which concerns the principles of valid thought, is called *deduction*; the other, that which tries to establish consistency between thought and things thought of, is called *induction*. In practice the two work together, but we shall consider them separately, beginning with deduction.

The bricks, so to speak, out of which deduction is built are *propositions*. What is a proposition? You may have heard of the word and are slightly scared of it. Well, don't be, for a proposition is simply a verbal statement of anything that can be believed, disbelieved, supposed or doubted. You've been using them all your life! Every time you state one of these judgments of believing, etc., you are stating a proposition.

In logic, in order to make things easier for ourselves, we state our propositions in certain definite forms. For example, there are four so-called *categorical* propositions. We give them that name because they say whatever they

have to say without any reservations. When pompous people "categorically deny" a thing, they deny it without reservations. In logic we can categorically deny or categorically affirm.

For example, we can say "All planets have mass." This is a categorical affirmation of the belief that every planet there is has the attribute of mass. Because we are talking about *all* planets, we say that the proposition is a categorical *universal* affirmative. If we said "Some planets have mass" then we would not necessarily be talking about all planets, and we would be stating a categorical *particular* affirmative proposition.

But we may not believe either of these statements. Then we might say "No planets have mass" or "Some planets do not have mass." These are the other two kinds of categorical propositions. The first one, because it deals with the whole class of planets, is a universal negative; and the second, because it does not necessarily deal with the whole class of planets, is a particular negative. (Note that in particular propositions the "some" is interpreted to mean "some at least, maybe

all," *not* "some only, but not all.")

Now, we can save ourselves a lot of writing by using the letter S—meaning "subject—for planets, and the letter P—meaning "predicate"—for mass. Thus we can symbolize the four categorical propositions as: All S is P, No S is P, Some S is P and Some S is not P. We can go further. If we take the first two vowels of the Latin word *affirmo* and stick them in that order into the *affirmative* propositions, we get SaP and SiP. If we take the vowels from the Latin word *nego* and stick them in that order in to the *negative* propositions, we get SeP and SoP. Thus, in company with the best logicians, we shall have the convenient shorthand:

All S is P written as SaP.

Some S is P written as SiP.

No S is P written as SeP.

Some S is not P written as SoP.

Try to remember them for next month!

Now let us look at some other kinds of propositions, bearing in mind that most of the forms are interconvertible; the different forms have been standardized merely for special purposes. Well, we have class-

membership propositions. These state that something or other is a member of such and such a class. For example, "Neptune is a planet" tells us that the thing known as Neptune belongs to the class of things known as planets. For this kind of proposition we use a shorthand made up of Roman and Greek letters. Now don't be frightened! It is quite simple. See: We use italic letters from the end of the Roman (*i.e.* ordinary) alphabet to represent individuals—*x*, *y*, *z*, etc. These stand for anything which has a name of its own, *e.g.* Neptune, John, The Queen, London, *Authentic*. For classes we use letters from the beginning of the Greek alphabet— $\alpha$  (alpha),  $\beta$  (beta) and so on. And for the "is a" in between we use the Greek letter  $\epsilon$  (epsilon). Thus our proposition about Neptune being a planet, and *any* proposition of that type, can be written nice and quickly as  $x \epsilon \alpha$ .

Then we have propositions which state that one class belongs to another class. For example: "Robots are machines." Here we state that the class of things known as robots belongs to the class of things known as machines.

These are called *general* propositions. The shorthand for this form is just like that for class-membership propositions, except that we have to show a class and not an individual on the left hand side of epsilon— $a \in \beta$ . (The  $\epsilon$  of course can mean the plural of “is a.”)

Now *all* the propositions we have mentioned so far are known as simple propositions, because they consist of only one proposition. There are also *compound* propositions, which consist of two or more simple propositions asserted together as a single statement. There are four kinds of compound propositions—implicative, alternative, conjunctive and disjunctive.

An *implicative* proposition could be written as “If space travel is possible, then flying saucers are real.” Here we are saying that the first proposition—“space travel is possible”—*implies* the second proposition—“flying saucers are real.” We use the letters  $p, q, r$ , etc. for simple propositions and we use a U on its side to represent the idea of implication. So the implicative proposition is written simply as  $p \supset q$ .

*Alternative* propositions state that *either or both* of two propositions is true. For example: “Either Mars is smaller than the Sun, or it is farther away.” Here we are saying that if you want to know the true state of affairs, you must either accept both these propositions as true, or you must accept the first proposition or you must accept the second proposition. We are also claiming that it is not possible for the propositions to be false. (Of course, we may be wrong in claiming this, but this *is* what we claim when we state such a proposition.) Alternative propositions are symbolized with a  $v$  (which is the first letter of the Latin word *velo*, meaning “or”), thus:  $p \vee q$ .

*Conjunctive* propositions are made up of two or more simple propositions connected by the conjunction “and”—“He pressed the firing button and the ship blasted off.” The simple propositions have to be related to each other, of course, and the whole proposition asserts that *both* the constituent propositions are true. A dot is used to symbolize “and”— $p \cdot q$  (which can be read as “Both  $p$  and  $q$  are true”).

*Disjunctive* propositions are, in effect, contradictions of the conjunctive type. They assert that it is not true to say that both  $p$  and  $q$  are true, and that they may both be false, though leaving open the question as to whether one of them is true and the other false. For example: "It is not true that Greenwich has the largest telescope in the world and that Greenwich astronomers have photographed the farthest nebulae." To symbolize these propositions we use the so-called glide:  $\sim$ . Thus our disjunctive proposition becomes  $\sim(p \cdot q)$ , which can be read as "not both  $p$  and  $q$ " or as "it is not the case that both  $p$  and  $q$  are true."

The glide can be applied to any propositional statement. For example,  $\sim(p \supset q)$  means "it is not true that  $p$  implies  $q$ ," and  $\sim p \vee q$  means "either  $p$  is false or  $q$  is true." Note that when we use brackets we negate everything inside the bracket, but that when we do not use brackets we negate only that symbol which immediately follows the glide. Thus  $\sim p \vee q$  means "either  $p$  is false or  $q$  is true" but  $\sim(p \vee q)$  means "it is not true to say either  $p$  or  $q$ ."

In the case of the categorical propositions, we place a bar over the top of the S or P to express negation, e.g. if  $SaP$  is written for "All men are mortal," then  $SaP$  means "All men are immortal" and  $\bar{S}aP$  means "All non-men are mortal." Also, note that if  $x \in a$  means "John is a tall man," then  $\sim(x \in a)$  means "John is not a tall man" and  $x \in \bar{a}$  means "John is a short man or a medium height man."

Now for some homework! See if you can express these propositions in one or other of the logical forms, name them and give their symbolic form:—(a) Space stations are artificial satellites, (b) Japetus is not a moon of Jupiter, (c) If a spaceship hull is unsealed, then air will not leak in, (d) Men who travel in space are either brave or trying to escape from something, (e) Space is not a vacuum, nor is it infinite.

I'll give you the answers next month, when we shall pass on to *inference*. This is the process of arriving at new information from given propositions. To do this validly is something of which few people are capable!



## FICTION

Yet another first class novel from the prolific pen of Isaac Asimov is *CAVES OF STEEL* (Doubleday, 575 Madison Avenue, New York, 22, U.S.A. \$2.95). It's a murder story of a most unusual kind. Set in the remote future, when New York lies deep beneath a steel canopy and functions as a communal unit in the truest sense of the word, the story follows the adventures of a policeman in tracking down the murderer of an Earthman by the Spacers. These latter are descendants of early emigrants from Earth, who had their own ideas about how to live. One of their ideas is that robots should be a part of civilised communities. And a robot is assigned to work with the policeman. Asimov, of course, knows robots well. And this

tale does nothing to change the views he has already put forward about them—that the main difference between men and robots is that robots are fundamentally decent. Highly recommended.

Weidenfeld & Nicholson (7 Cork Street, London, W.1) add two more titles to their science fiction bookshelf with *THE TITAN AND OTHER STORIES* by P. Schuyler Miller and *AHEAD OF TIME* by Henry Kuttner, both at 9s. 6d. These are both anthologies of the respective author's stories. Of the two, *AHEAD OF TIME* is undoubtedly higher in quality, though *TITAN* is certainly worth reading. Perhaps the difference could be indicated by saying that Kuttner's book requires the reader to do a certain amount of thinking,



whereas Miller's collection just rolls along in almost pure entertainment. Even so, *THE TITAN* has rather more imaginative stories than *AHEAD OF TIME*, which tends towards the psychological.



Another British science fiction anthology that we are very pleased to see is *THE TWENTY-SECOND CENTURY*, a collection of John Christopher's stories put out by Grayson and Grayson (16 Maddox Street, London, W.1) at 9s. 6d. Christopher is an old friend—or enemy—of *Authentic* readers—you either rave over his stuff or you hate it—and we are pleased to see reprinted in his anthology a story which originally appeared in *Authentic* No. 39, viz, *BLEMISH*. Along with this are nineteen other stories, all of the usual high Christopher standard, thought-provoking, sometimes anger-provoking, never mediocre. In this collection we see that Christopher is master of the atmosphere story, the action story, the psychological story and—rare thing—the humorous story. Exceedingly highly recommended.

Penguin Books, Ltd. (Harmondsworth, Middlesex) have republished *VOYAGE TO PERULIA* by Elmer Rice at 2s. Strictly speaking, we should not be reviewing this, for it is pure—or slightly impure—fantasy. But we feel that its message is so interestingly presented, in such a light-hearted and humorous way, that you will delight in it. Just so long as you don't expect accurate science in it, you will be enthralled by the melodramatic adventures of the heroes on Perulia, where natural laws are indeed suspended. You can read in this tale a sly, grinning, friendly ridiculing of—ah, but you must find that out for yourselves! No better two bob's worth on the market.



The third series of *THE BEST FROM FANTASY AND SCIENCE FICTION* has been published by Doubleday at \$3.25, which is quite a stiff price. But we think the book is worth it, for it really does contain sixteen of the finest science fiction and fantasy stories that have ever seen print. Literate, scholarly, intelligent and provocative, these tales are not for those who love only space opera.

But if you take an intellectual enjoyment in your imaginative reading, this book is for you. The authors are all well-known for their splendid craftsmanship, and the stories have all run the gauntlet of reader opinion in the *Magazine of Fantasy and Science Fiction*, the editors of which are the editors of this anthology. With the reservations made above, the book is highly recommended.



Those of you who have made the acquaintance of Professor C. P. Ransom in magazine form will undoubtedly be pleased to know that Doubleday have published a collection of these stories by H. Nearing, Jr. Called *THE SINISTER RESEARCHES OF C. P. RANSOM*, it costs \$2.95, which is very reasonable. The book contains eleven stories, six of which first appeared in the *Magazine of Fantasy and Science Fiction*, and which have been linked very cleverly with the remaining five. It is a kind of episodic novel, each chapter describing Ransom's attempts to devise a gadget that will advance the liberal arts—in order to capture an endowment for his university, and at the same

time to save himself from being made to give a broadcast series of lectures on mathematics. In the grand Ransom manner he comes up with a poetry writing machine, a mathematical voodoo, a malignant organ, an actinic ghost and a number of other equally intriguing devices. As usual, his old friend, Professor of Philosophy MacTate, comes in for more than his share of the kickbacks involved in the projects. Great fun, wittily written and intelligently thought out. Everybody will like this one.

Three Panther Books at the top of Hamilton's list of 6s. bound books are *WORLD AT BAY* by E. C. Tubb, *THE ECHOING WORLDS* by Jonathan Burke, and *THE INDESTRUCTIBLE* by Rolf Garner. Tubb's story is one of the best novels he has ever written. It is about a clash, a fierce struggle, a life-or-death conflict between official science and heretical science. England of the future is the setting, an England that is on its way to doom by starvation, an England that could be saved if atomic research were put into play. But a League of

Peace, a kind of vigilante organisation, has forbidden atomic research and thereby, in effect, cut England's throat. Two heterodox scientists don't like this. They set to work in secret and start up atomic research. Unfortunately, their work releases upon the world a threat even greater than starvation—and with little connection with radiation bomb destruction. Orthodox science has to pit its wits against this devastating threat, and the story moves forward powerfully, reaching deep images of human fear, ambition and sacrifice. The usual Tubb dryness is there, and the slick, crisp pace of the book makes for rapid reading.



THE ECHOING WORLDS has been written before, as far as plot is concerned, but rarely quite as effectively and interestingly as this. The basic idea is parallel worlds, both in the present. What we know as our world is in an even worse state than it is now, though war has been abolished. There is something stultifying about perpetual peace, apparently. And young men of Earth who are not fit enough for space travel find life most dull. They get

themselves transferred to the parallel world and there they find war in plenty, together with romance, adventure and a certain amount of soul-searching. The critical point, of course, comes when intercourse between the two worlds is attempted. Then all hell is threatened to be a-poppin'. In places and at times, THE ECHOING WORLDS becomes a little space-operaish, yet even then the drama is played out with remarkably restrained technique. It is not a first class novel, but it indicates that Burke will one day write one of that calibre. We are waiting for that. Meantime, THE ECHOING WORLDS is one of his best.



THE INDESTRUCTIBLE appears under the name of Rolf Garner, which is a pen-name of Bryan Berry. Thus, knowing this, it should be obvious to all what kind of story this is. Some people can't stand Berry's stuff, others dote on it. All we can say is that here is typical Berry quality, though not in quite his usual style. It is the last in a kind of trilogy; the other two titles were RESURGENT DUST and THE IMMORTALS—both still available in limited numbers.

In this series is perpetuated the character Lord Kennet, a spaceship captain of the up-and-at-'em, I-can-do-anything type. The interesting thing is that usually Captain Kennet *can* do it, and quite feasibly too. Therein, perhaps, lies the main appeal of this book—and its earlier relatives. The plot is fairly ordinary and of the old school of science fiction. But Berry brings to it

a modern slant of credibility often totally lacking in the classical stories of this space-roving, swashbuckling type. Kennet is not a superman; merely extremely intelligent, shrewd and courageous. Also, of course, he gets many of his successes because so many ordinary people are little less than fools! An interesting book.

## NON-FICTION

The first non-fiction book by William F. Temple—a well-liked contributor to *Authentic*, has been published by Frederick Muller (Earls Court Gardens, London, S.W.5) at 6s. It is called *THE TRUE BOOK ABOUT SPACE TRAVEL* and is aimed at the juvenile market. For that it is especially suitable. Temple has managed to put over this somewhat complex subject with ease and erudition and simple prose. But the book will also be of considerable interest to adult readers—who may, as an excuse, buy it for their sons or nephews!—for it contains a fair amount of most interesting material that is not normally included in

books on space travel—sections on language difficulties with alien races, for example.

It is rather a pity, though, that the American design of satellite station has been described and quoted as a distinct possibility; British experts are convinced that this pretty-pretty design will not function because it ignores the following natural laws: (a) objects expand on heating, (b) material objects have inertia, (c) light proceeds in a straight path unless reflected or refracted, (d) the moment of momentum of a rotating body must be conserved, (e) if a force is impressed upon a body in rotation such that its axis of rotation is disturbed,

precession is induced, (f) it is impossible to utilise more energy than is available. *Authentic* has been pointing out for some time that it is not a good thing for British authors and publishers to help perpetuate what is considered to be a thoroughly unscientific and unworkable design. Even though Temple's book is for children—or maybe even because of that—there is no excuse for the author's ignoring the dicta of his intimate astronautical expert friends. That, though, is the only fault we can find with *THE TRUE BOOK OF SPACE*, and it certainly is not big enough in this instance to prevent anyone's buying the book.



Somewhat similar to the above is the *COMPLETE BOOK OF OUTER SPACE*, published by Sidgwick & Jackson (44 Museum Street, London, W.C.1) at 10s. 6d. Only, in this case, it is difficult to recommend. The title seems to have little bearing on the contents, for outer space is dealt with in only one chapter; the rest concerns the ordinary matters of interplanetary flight. The whole book is American and has been pub-

lished by arrangement with the Maco Magazine Corporation, but it has one British article—"Interstellar Flight," by L. R. Shephard. The book is spoilt by the illustrations—the non-photographic ones—for these are fantastic in the extreme and bear little relation to the teachings of science. The text is rather better, but not a lot. The authors are mainly those who have appeared in the other American books of this type—*ACROSS THE SPACE FRONTIER*, *MAN ON THE MOON*, also published by S. & J. Whereas the first two were pretty good, this one is not. And—our old hobby-horse!—it, too, perpetuates the ridiculous cart-wheel space station.



Two highly recommendable books come from Odhams Press (Long Acre, London, W.C.2). One is *MODERN SCIENCE ILLUSTRATED* at 25s. The other is *THE MODERN SELF-EDUCATOR*, at the same price. Very often books of this kind are not very good value, but we have no hesitation whatsoever in saying that 50s. spent on these two titles is money very well spent by any science fiction reader who has had no academic training

in science. MODERN SCIENCE ILLUSTRATED is fully up-to-date in the material of its sections—physics, chemistry, biology, astronomy and geology. The subjects are approached from the everyday angle and profuse illustrations link the work of the laboratory with the lives led outside them. Many quite recent scientific topics are fully dealt with—for instance, atomic physics, creative chemistry and visitors from space. Yet, in each case, the exposition is so clear and exact, and the illustrations so apt that no reader of normal intelligence could find difficulty in following the text. The authors of the sections are each experts in their particular study, and they bring scholastic competence to every page. They are to be congratulated on doing well what this reviewer knows to be a most difficult task—presenting *modern* science in an easily understandable form.



THE MODERN SELF-EDUCATOR is of the same high quality and has the same features to recommend it. It takes the form of twelve complete courses in: world history, English history, Eng-

lish, economics, geography, biology, physics, chemistry, mathematics, logic, psychology, philosophy. Each course is designed for the student working alone, and has a set of questions and answers by which the student can test his progress. A lively attitude is taken to each subject, and the exposition does not at any time become dull. Special praise is due, we think, to the authors of the economics and philosophy sections. These two seemingly vague subjects are pinned down expertly and simply, yet cover an enormous amount of ground. The other sections are simpler to present, of course, and we find no fault with them, except, perhaps, that the biology and mathematics courses do not cover as much of their subjects as do the other sections. And it is a great pity that there is no index, no bibliography and no footnote references to sources of quotations. Perhaps the publishers will incorporate these things into a second edition.

There can be no doubt that the many readers who write to us deploring their lack of scientific knowledge will find in these two books a most

palatable exposition that should cover all their wants. Please buy them.



LANDS BEYOND is another of those rather extraordinary books that Willy Ley writes when he is not turning out space travel books. This one is jointly authored by L. Sprague de Camp, is published by Sidgwick & Jackson at 21s., and takes the general form of DRAGONS IN AMBER, THE LUNGFISH AND THE UNICORN, etc. You will now know that it is eminently readable, intriguingly broad in scope of ideas, and that it deals with the kind of things that no one else has ever written about in the same way. LANDS BEYOND, in the publishers' words, is "a sort of geography of those lands of the imagination which figured in the tall tales of travellers and poets." Atlantis, El Dorado, the Sea of Sinbad, the land of Prester John, Golden Men and Amazons—these and others just as absorbing form the chapters of this excellent book of fabulous parts. The book is very well worth reading, and S. & J. must be congratulated on bringing the book out in its original American design.

An indispensable "must" for all science fiction readers who are sometimes troubled by the meanings of scientific terms and ideas in stories is THE SCIENCE READER'S COMPANION, published by Ward Lock (6 Chancery Lane, London, W.C.2) at 15s. This is a 256-page book listing in alphabetical order an enormous number of terms, together with long explanations of their meanings. Supporting the text are 200 diagrams and 50 very excellent modern photographs. Here and there are slight inaccuracies or biased explanations, but it would be invidious to point them out, for they hardly affect the general usefulness of the book. Remember that this is not merely a dictionary. In effect, the nine well-qualified authors have produced an elementary textbook of antibiotics, archæology, astronautics, astronomy, atomic physics, biochemistry, chemistry, electricity, electronics, ethology, geology, mathematics, mechanics, medicine, metallurgy, meteorology, palæontology, physics, physiology, plastics, psychology, radiology, radio, television. And a great many of the terms are of very recent

introduction. What more could you want for 15s.? Students preparing for examinations involving any of these subjects will find it most time-saving for checking the meanings of terms that have slipped the memory. A most notable book.



PENGUIN SCIENCE NEWS No. 31 contains six articles that do not seem to be of such

general interest as usual. Solvable and Unsolvable Problems, Why Chemical Engineering?, Fundamental Particles—The Present Position, Chemical Radiomimetic Agents and Cancer, Interferometry and Astronomy, and Weed Control are the six. Of these, the fundamental particle and interferometry articles are, perhaps, the most interesting for our readers. The regular Research Report is good as usual.

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# March of Science

A most remarkable invention that would be of great use in spaceships is what has been called "A vest pocket laboratory." Devised by Dr. J. T. Stock and F. A. Hill, respectively Head of the chemistry department and Senior Lecturer in chemistry at the Norwood Technical College, this equipment was specifically designed to obviate the difficulties caused by cramped laboratory space—a condition that will certainly obtain on future spaceships. In effect, the equipment is a complete organic chemistry laboratory unit only thirty-six by twelve inches.

It includes sixty-one components in the form of the modern interchangeable glassware grouped about an upright wooden stand. Terry clips hold the apparatus to the stand, and it is assembled in three sections. First there are analytical pieces—water-bath, pipette, melting point apparatus, condenser, a continuous-extraction set-up and rotary fractionating equipment with distillation appara-

tus. Steam distillation, fractional distillation and vacuum distillation are accomplished by three separate assemblies in the second section. The third section is a kind of in-between assembly of Willstatter filters, Schwinger filter, ice bath, drying tube, separating funnel, and water inlet and outlet. A modified bunsen burner—or more than one—supplies any heat necessary.

Dr. Stock is working on other pieces of miniature equipment, and it is to be hoped that in time there will be sufficiently different models to pack a complete scientific investigation laboratory into one of those tiny cabins that lie high in the nose of spaceships.

In a letter to *Chemistry and Industry*, Mr. William Mitchell makes a humorous suggestion with reference to element 99—mentioned in March of Science last issue as having been given the provisional name of "ekaholmium." Mr. Williams suggests that we call this element simply "99." "Then when it

becomes more abundant, we can conveniently refer to '99ous and 99ic oxides' and so on." Though Mr. Williams puts this suggestion forward lightheartedly, we wonder whether there is more in it. Since the periodic classification is so fundamental a part of chemistry, it might well aid in an understanding of that subject if elements were referred to by their periodic position rather than by some arbitrary fancy name.

This would tend to bring chemistry into line with the biological sciences, where the name itself carries intrinsic meaning. "Sodium" means nothing until you have been told what it is. But "11" would mean a great deal to anyone who had acquaintance with the principles of periodic classification. However, such a revolution in chemical nomenclature would hardly be accepted by the prejudiced old-timers in the field—of which there are many!

Though Switzerland is often regarded by the ignorant as a kind of cultural backwater, taking no part in the conveyor-belt slaughters that rock the rest of the world from time to time, recent rocket developments in that country indicate

that she is very much alive to the way the world is going, and that she will follow it as far as she thinks necessary for her own preservation. To this end Swiss scientists—always of high calibre—are reported to have developed a £5,000 rocket that will soar upwards to twelve miles with such precision that it will destroy any plane within a radius of fifteen miles from its base. Tests with radio-controlled, unmanned aircraft are said to have proved most satisfactory. Thus, Switzerland will keep her skies clean in the future, just as she has kept her land clean in the past. By utilising science.

The right kind of attitude was expressed by the Prime Minister of India, Mr. Nehru, a while back when he opened the Central Laboratories for Scientific and Industrial Research at Hyderabad. Said Mr. Nehru: "Science has changed the whole world, and we in India must accept that. Scientists and engineers are far more important than administrators." Many will agree with him, and some will wish that science and administration were more often combined in the same man. Then scientific rule would replace emotional misleading.

# SIR ISAAC NEWTON

by H. J. CAMPBELL

There can be very few scientists and scholars in any part of the world who would disagree with the statement that Sir Isaac Newton was the greatest scientific genius the world has yet known. Such a title does not come lightly. It is not conferred on men who merely make discoveries, for it is well known that discoveries are often accidental and are little indication of the discoverer's mental stature. To be accepted as a great man of science one must have an *influence* on contemporary science and future science. To be accepted as the *greatest* of the great, one has to have the *greatest* influence. Thus, it is considered that Newton had more influence on the whole course of science than any other man, living or dead.

Newton's most productive years were the two years he spent at his family home in Lincolnshire when the bubonic plague caused the closing of Cambridge University, where he was Professor of Mathematics. He was then about twenty-three years old. Behind him were many years of close study of other people's views

and data, in a wide variety of subjects. The time had now come, he thought, to start using his own gifts. What he did with those gifts has made history call those two years: "years of achievement unparalleled in the history of science." His abilities were in a sense tripartite, although of course all three parts worked together. He would have been a famous man with any single one of his gifts of mathematical inventiveness, manipulative skill, and physical intuition. It has been said that his mathematical inventiveness gave the world the differential and integral calculus; his manipulative skill brought about the systematisation of optics into an experimental discipline; and that his physical intuition enabled him to create the science of dynamics and the theory of gravitation by successfully defining force and mass.

Newton himself was convinced that he differed from other men only in possessing great patience and persistence. He would not admit that the quality of his ideas, the "struc-

ture" of his mind, was superior to other men's. This, perhaps, was because Newton was contemporary with such famous figures as Robert Boyle, Edmund Halley, John Flamsteed and Isaac Barrow. All these men were intellectual giants, and Newton no doubt found it difficult to place himself above them. But posterity has decreed otherwise.

The main difference between the way Newton's mind worked and that of most of his contemporaries was seen in the very first paper he presented to the Royal Society. This was called a *New Theory of Light and Colours*. In the past, and with other men, such a paper would have been punctuated all over with references to some written authority, with long arguments about words, with a great many irrelevances, and with quite a number of supernatural—i.e., unobservable—phenomena adduced as explanations. Newton's paper had none of these

Newton first stated a fact—that sunlight passed through a circular hole in a screen and thence through a prism assumes an oblong shape. He went on to show that the then current laws of refraction would not explain that fact. Then he spent some time showing that no experimental errors

had caused the effect—by bringing up as many possible errors as he could think of and then proving that they did not apply. His penultimate step was to show that the original phenomenon resulted from a hitherto unknown property of light, viz., that it was composed of different colours. His final step was to collate his observations into three new laws—which, being inductions from experiments, could be overthrown only by finding something wrong with his experiments, not merely by *talking*. These laws are now learnt by every schoolboy who studies physics; this is because they are of fundamental importance, affecting every aspect of light phenomena.

Thus, though Newton's discoveries would have assured him a place in history, it was his *methodology* which really made him the greatest of all. Bacon had campaigned for an emphasis on experimental procedures rather than appeal to past authority. Newton crystallised that campaign and showed scientists of all future generations how they should go about their tasks to get maximum accurate results and maximum progress. Science was never the same since his time. (*For further details see Isaac Newton by L. T. More.*)

# FANZINES

The first issue of CANADIAN CAPERS shows that British science fiction fans in the New World are as fully capable as those in the old of turning out an acceptable fanzine. CC is edited and published by Harry Calnek, Granville Ferry, Nova Scotia, Canada, and is the official news-zine of the Canadian Science Fiction and Fantasy Fan Association. This particular issue is supplied free to members of the CSF/FFA and on a pay-if-you-like-it basis to other interested parties. Thus, it has no stated price. No doubt Harry would be glad to make arrangements with fans in Britain for subscriptions. It is a large-size publication of twenty-six pages containing a few drawings, which are quite good. The text-matter is somewhat exceptional among fanzines, in that it is adult and intelligent. Most of it consists of articles intimately related to fandom and fan opinion. There is one story, and it is fully up to

fanzine standard. Naturally, quite a lot of the contents concerns Canadian fandom, but there are articles of general interest as well—for example, a piece by Joe Keogh that tries to answer the question: What makes big-name magazines big? Very commendable.

ETHERLINE is an Australian fan publication that more or less takes the form of a newsletter. It is a fortnightly, published by Amateur Fantasy Publications of Australia, and edited by Ian J. Crozier from 6 Bramerton Road, Caulfield, Victoria, Australia. British subscription rates are 12s. per 26 issues; 6s. per 13 issues. Australian rates are 15s. per 26 issues; 7s. 6d. per 13 issues. American rates are \$2.00 per 26 issues; \$1.00 per 13 issues. (All rates include postage.) ETHERLINE supplies news of Australian science fiction matters and bits and pieces about science fiction and fandom

throughout the rest of the world. Books are reviewed, club meetings reported, films noticed and letters printed. Well-duplicated, 20 pages, drawn cover. Good.

QUESTION MARK is another Australian fanzine, edited by Kevin Wheelahan from 4 Myrtle Grove, Preston, Victoria, Australia. For 12 issues the subscription rates are: British, 10s.; Australian, 12s. 6d.; American, \$2.00. QUESTION MARK can be obtained together with ETHERLINE for the special rate of 24s. per year. It is very nicely produced, has some 36 pages devoted to thought-provoking articles such as The Why and How of Dianetics, How Will Space Travel Affect Science Fiction?, About Flying Saucers, etc. All well done, adult and intelligent, like the Canadian publication.

ORBIT is the magazine of the Leeds Science Fiction Association. It is edited by George Gibson from The Adelphi, Leeds Bridge, Leeds, 1, and costs 1s. per copy. It has in the region of 20 pages containing stories, articles and various regular departments such as fantasy focus, readers'

letters, film reviews and a quiz. The production could easily be better, though it is pretty good. There is a very slight tendency towards the adolescent, if you like that kind of thing; but only slight.

FANTASY TIMES, the oldest science fiction newspaper in the world, still keeps going strong, and still keeps coming out twice a month, often with supplements. Usually there are about six to eight pages, and a lot of this is advertisement, but FT really does keep you up to date with science fiction affairs in all parts of the world. It is edited by James V. Taurasi from 137-03 32nd Avenue, Flushing 54, New York, U.S.A. British subscription rates are 9d. per copy; 15s. a year (from Milcross Book Service, 68 Victoria Street, Liverpool, 1.) Australian rates are 1s. per copy; 10s. for 12 issues and £1 for 24 issues (from Roger Dard, 232 James Street, Perth, Western Australia). American rates are 10 c. per copy; \$1.00 for 12 issues.

SCIENCE FICTION NEWS is a printed publication put out by G. B. Stone, Box 4788, G.P.O., Sydney, N.S.W., Australia.

It's a monthly and costs 6s. per year. Normally it consists of four pages of close-set type covering major and minor science fiction events throughout the world, with the accent on American and British.

ORION, which seems to have a vague sort of connection with the Lakeland Science Fiction Organisation, comes from Pete Campbell of 60 Calgarth Road, Windermere, Westmorland. It is quite a nice little job of about 30 pages, neatly duplicated and containing some cogent articles and a couple of quite competent stories, as well as news and reviews and readers' letters. The rather astonishing thing is that nowhere on the issue to hand does it state how much the thing costs. If you want it you'll just have to write to Pete. One intriguing aspect of ORION is that it uses black, red, green and purple inks. That, and a pink cover too!

Just as we go to press comes a copy of THE ENCHANTED DUPLICATOR, by Walter Willis and Bob Shaw. This is not a fanzine, but is, in the words of the authors, "a serious, constructive, insurgent publication." In plain English, that means that Walter and Bob have written another funny story. We have not yet read it, but we don't doubt that it will be well worth the shilling charged for it, from Walter Willis, 170 Upper Newtownards Road, Belfast, N. Ireland. All we can tell you at this point is that the story—27 pages long—concerns the mythical journey of a mythical fan from the mythical land of Mundane to the mythical land of Tru-fandom, crossing on the way the mythical Jungle of Inexperience and the mythical Desert of Indifference. Though, knowing the authors, maybe there's not so much myth there after all.

# The Supermancon

Post-war British national science fiction conventions have all been held in London—a natural enough choice for many reasons. On the whole, they have proved entertaining and memorable occasions, attracting science fiction and fantasy enthusiasts from all over Britain, the Continent, and the United States. But the feeling grew among provincial fans that the locale should be changed once in a while, and at the 1953 convention—The Coroncon—it was proposed by members of the Nor'west Science Fantasy Club that the next session should be held in Manchester. At the time this call for a change evoked a very mixed response, but increasing popular support for the idea prompted the club to form a committee to draft preliminary arrangements for a Northern convention to be held in 1954.

The club had already gained experience in organising a convention. Towards the end of 1952 a one-day get-together, dubbed the Mancon, had attracted some 85 provincial fans to the Waterloo Hotel, the club's meeting place. A suitable site for the second Manchester convention, lovingly referred to as the Supermancon, was found after a short search—the Grosvenor Hotel. Centrally situated, adjacent to two main railway stations, this hotel provides ideal accommodation. There is a roomy hall for the main sessions, with an annexe in which

displays by fan groups, publishers and dealers will be arranged. Most important of all, to some fans, there is a bar in the annexe! The convention will be held at the traditional time—Whitsun week-end, June 5th and 6th inclusive.

It will be quite an international gathering—we hope to see fans from the United States, Canada, France, Germany, Belgium, Holland, Norway, Greece, Malta and North Africa. Fandom will be represented in strength—the Supermancon Society already includes the following fan personalities among its members—Walt Willis (editor of *Slant* and *Hyphen*), Tony Thorne of the Medway Science and Fantasy Club, A. Vincent Clarke (fan-of-all-work), John D. Roles (editor *Space Diversions*), Pete Campbell (editor *Andromeda*), Michael Rosenblum (collector), Fred Robinson (editor of *Camber*), Walter H. Gillings (who has been styled Mr. Science Fiction of Great Britain), Dag Siggerud of Norway, Jan Jansen (editor of *Alpha* the Belgian fanmag), and fan artists Ken McIntyre and Jack Wilson. One disappointment is that the Arch-Fan Ken Slater, Chief Operator of *Operation Fantast*, will not be able to join the meeting. Among the authors we hope to see are Bryan Berry, E. C. Tubbs, Sydney Bounds, Bertram Chandler, E. R. James, Eric Frank Russell, John Christopher, John Russell Fearn and William F. Temple.



Most of the programme has been planned and detail work is under way. Among the highlights is a mock trial of H. J. Campbell for crimes alleged to have been committed against provincial fandom—Pete Campbell will appear for the prosecution, Ted Tubb for the defence, in a court presided over by Judge Walt Willis, with a jury (handpicked!) of prominent fen. The prisoner is at present on bail editing *Authentic Science Fiction*...

John Gunn, who is a member of the Magic Circle, will demonstrate the power of telepathy and perhaps introduce us to the Demolished Fan.

There will be a session "The Editor Speaks . . ." in which Bert Campbell (*Authentic*), Alistair Paterson (*Vargo Statten Mag*), Ted Carnell (*New Worlds* and *Science-Fantasy*), Peter Hamilton (*Nebula*), Nic Oosterban (*Planet*), and Jock Curle (Grayson and Grayson), will tell of future plans.

The fans will get their chance later, when a panel of fan-editors will be given the opportunity of saying a few home truths about rival fanzines.

Still on the lighter side, there will be a sketch involving a TV Lie Detector, a play by Walt Willis, a diatribe against science fiction by old-time fan Eric S. Needham, an "Ask me another" session, a Bran Tub (sixpence a dip, but value for money!), and a variety of games and competitions.

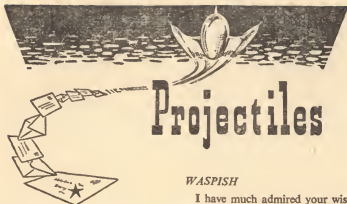
On the more serious side will be interludes to enable representatives of the various fan groups to say a few words about local activities, and

visitors from overseas to join in. A research chemist will be describing how atomic energy is utilised and has promised to give a practical demonstration of the controlled release of atomic energy. (All attendees are recommended to bring lead-lined waistcoats for this session!)

Items which are still being arranged include talks by various authors, and the showing of films.

The convention will, of course, officially close with an auction. All the books in the N.S.F. Club Library dated before 1952 will be put up for sale, and they are mainly American magazines and include scarce first issues. The Committee has received several donations of books for the auction, but further gifts would be welcomed by Frank Simpson, the convention auctioneer, at 21 Greenway, Alkrington, Middleton, Lancs.

If you want to attend the Supermancon, join the Supermancon Society without delay by sending 2s. 6d. (50 cents) to Brian H. Varley, the convention treasurer, at the Balmoral Hotel, 33 Princes Square, London, W.2. This will ensure that you receive all *Bulletins*, giving details of arrangements, as well as a free Souvenir Programme, which will take the form of a large, quarto booklet in which fan editors show off their wares, old fans reminisce, and younger fans plan for the future! The fee for attending is 6s. per day; members of the Supermancon Society, however, pay only 3s. 6d. for the Saturday session.



# Projectiles

## Overseas Section

### S.A. FANZINE

A fan in Johannesburg has decided to start South Africa's first fanzine (as far as is known); and he has asked me to write to any editors or authors I think might be willing to write an article or short story for the 'zine. My reason for writing to you is not that you are my "favourite author/editor/magazine" but because you seem to take an interest in fanzines, and offer constructive, not destructive, criticism.

A. Fabig, 228 van Heerden Street,  
Capital Park, Pretoria, S.A.

*We know that many of our readers contribute to British Fanzines, Mr. Fabig, and we hope they will answer your call for material.*

### WASPISH

I have much admired your wise and waspish answers to the readers' letters section; a singularly devastating *tour de force* with which to answer the young and hasty correspondent (e.g., editorial replies to J. R. Elder and Basil Coukis in No. 41.)

Leonard Pruyn,  
730½ No. Sweetzer Ave.,  
Hollywood 46, California, U.S.A.

Thank you, Mr. Pruyn!

### MIND OR MATTER?

I simply cannot see how some people can resent psychology in stories. I know perfectly well that psychology has become a civilisation-induced madness, as every Bob, Dick and Harry now volubly explains his blunders by his complexes, of which he seems to be very proud. But that's not the

tool's fault; it's the fault of the clumsy hands that wield the tool. Real understanding between intelligent people is no longer possible without studying psychology. Our mental make-up is different from the one of the middle-ages, is it not? Science fiction without the human element can be found in other non-fiction stories; we want science *plus* man.

Rose Frommann,  
Vervielfältigungsburo, Nurnberg,  
Germany.

*We agree with you about science fiction containing psychology, Rose, but we think you are a little confused on your more general statements. There is no evidence that our mental make-up has changed since the middle-ages; and it is a fact that many intelligent people who have not studied psychology do reach real understanding. Certainly they have a knowledge of the principles of psychology, probably innate. It may be in that, that their intelligence lies.*

## BACK NUMBERS

I can only lay claim to sixteen copies of *Authentic*, but I would gladly pay cost plus postage for second hand back issues. The copies I have missed are Nos. 1-20, 27, 28 and 30. I would be very

glad to meet fellow fans here in New Zealand.

James Cameron, 26 Senio Road,  
Trentham Camp, New Zealand.

*No doubt some of our readers will respond to your request, James, and we do hope you find a friend among our other New Zealand readers.*

## FLOWERS BY REQUEST!

Orchids to H. J. Campbell for his answer to a letter sent in by one Basil P. Coukis! What is it with this guy Coukis, anyway? Two syllable words *and* ideas he wants yet! Thanks, your answer was wonderful. And listen—all in all I'd say *Authentic* is England's *Galaxy*, which rates it high indeed. Earl "Plaster" Parris, Box 31, Lewes, Delaware, U.S.A.

## SWAPS

Could you mention in your magazine that I have a number of science fiction magazines (list available) which I desire to trade jazz records or what-have-you? Thank you.

Roy Morser, P.O. Box 1345,  
Miami Beach 39, Florida.

*What exactly do you mean by "what-have-you," Roy? You may be laying yourself open to trouble!*

*Anyway, we hope somebody writes you—and how is the Beach these days?*

## FAN FUND

Have received the cover from *Authentic* No. 31. Thank you very much! That gives the Transatlantic Fund four covers at present.

Don Ford, 129 Maple Ave.,  
Sharonville, Ohio, U.S.A.

*To readers who want to know what all this is about, we'll point out that*

*the Transatlantic Fund is a fan organisation that is trying to raise enough money to take a British fan to America for the 13th World Science Fiction Convention, being held in San Francisco this year. The Authentic cover will be auctioned, and the money devoted to the cause. The British end of the Fund is being handled by Walter A. Willis, 170 Upper Newtownards Road, Belfast, N. Ireland, to whom all enquiries and contributions should be addressed.*

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## Home Section

### EXCELLENT

Really, I'm ashamed of you! You produce the best story ever seen in *Authentic*—ignoring *THE ROSE*, which is in a category by itself—then slide it forward apologetically, muttering about lack of action! I'm talking about *OLD MAN OF THE STARS*, of course. It is excellent, and coming from me, you will know that that is unusual, and really deserved.

Paul L. Sowerby,  
21 Lansdowne Road,  
West Didsbury, Manchester 20.

*Paul! We're ashamed of you! You should know that we are never*

*apologetic about stories we put into Authentic. We simply pointed out that it wasn't space opera, but that it had some real worth. Thanks for agreeing with us—this once!*

### ANSWER

I was gratified to see my letter in print, but you did not touch on the salient point, which is the question: Is the knowledge necessary for the building of a Moon rocket already in existence?

R. C. Hope, 266 Pershore Road,  
Edgbaston, Birmingham 5.

*Yes.*

## GRATEFUL

My husband and I never miss *Authentic* and we both like it a lot. Well now, I answered Mr. James Pentland's letter in *Projectiles* and received a parcel of science fiction magazines from him this morning. I am so grateful for his kindness that I did think you who printed his offer would like to hear—from one at least—the follow through. Bless his kind thought, and you for making it more than a thought.

Mrs. Ada McComb,  
5 Arthuslie Street, Glasgow, S.W.1.

*Only too pleased to have been of help, Mrs. McComb. And thank you, too, James Pentland.*

## WAKEY, WAKEY!

Why, oh why is Norwich so silent in *Projectiles*? One would think that *Authentic* never got this far, despite what I know to the contrary. I am hoping to organise a fan club and fanzine for the area, but I just can't seem to find sufficient fans. Maybe those interested would care to drop me a line. Lastly, a heart-cry. Whilst overseas I missed some of your earlier issues. Nos. 2, 4, 5, 6 and 9 to 14 inclusive will be welcomed with open arms—and a generous purse. 4018608 Cpl. Wright, N.L.T., 84, A.M.Q., R.A.F., Horsham St. Faith, Norwich, Norfolk.

*You are not alone with this problem of fanzines, Norman. It is to the everlasting shame of London fandom that, despite strenuous efforts recently on the part of a small group of fans, it was found impossible to work up interest in a London fanzine. London, with the largest fan group in Britain, has not a single fanzine! Wakey, wakey, London—and Norwich.*

## QUERIES

Could somebody perhaps tell me how time travel is possible, since I always thought that it was impossible for two objects to occupy the same space at the same time, and air certainly has mass! Secondly, how does an "invisible man" see? For surely if he is invisible then light rays pass through his eyes and do not register on his retina.

2715371 AC/2 Richards, P. D.,  
Hut 141, 25 Flt., "G" Sqdn.,  
2 Wing, 11 S. of R.T., R.A.F.,  
Hednesford, Staffs.

*(They do give you chaps some of the oddest addresses!) Your time travel query depends simply on what you mean by space. In scientifically designed time travel stories it is usually assumed that a plurality of spaces exists. Or you can argue that since by relativity theory time and space are merely different aspects*

*of the same thing: a different time means a different space. But you do seem to have put your finger on a fallacy about invisible men—unless, of course, they are existing in some other plane of vibration or space; which, we suppose they would have to be in order to be invisible.*

### WRITING SF

Perhaps science fiction should touch upon space and other worlds atmosphere, but I feel that its greatest scope, and the most subtle, lies in the neat, psychological story that emphasises human weaknesses. I have always found these stories most provocative. For the thinker—and science fiction caters for this type of reader—the psychological story gives plenty of food for thought.

Laurence Cann,  
6 Jesmond Park West,  
Newcastle-upon-Tyne 7.

*You know what Freud would have said about you! Emphasising weaknesses, indeed! Why shouldn't the story emphasise human strength? And need it be psychological to do either of these things? As you know,*

*we are fond of psychological stories, but we'd hate to see science fiction restricted to that type. But many thanks for your views all the same.*

### PASSABLE

Have you read the load of slush in a recent issue of an American science fiction magazine? I refer to the article surveying British Science Fiction. According to the author, British science fiction is "occasionally passable" and Hamilton science fiction is considered to be "occasionally quite good." The author claims, too, that the covers of British science fiction magazines are "lurid." Heck, aren't they satisfied with "winning" the last three wars without trying to start another with British science fiction?

Michael P. Ward, Nostell Priory,  
Wakefield, Yorks.

*Calm yourself, Michael, it doesn't matter! Your Editor, when he was in America, met the author of that article and she admitted that she had based her remarks on very old material. Can the Americans help it if they are out of date?*

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*the best*  
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EXILES IN TIME ☐

**H. J. Campbell**

ANOTHER SPACE—ANOTHER TIME ☐

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shows in completion the star ship we showed in construction on our last cover. After many years of effort, high in the cold space above Triton, moon of Neptune, far from the warm Sun and mother Earth, the space engineers have built this remarkable ship to take mankind to the stars. It represents the most ambitious project man has ever undertaken.

The outer cylinder that lies midway along the ship contains the living quarters for the crew and passengers; these will include shops and farms and hospitals and all things necessary to make the ship a miniature world, to sustain the passengers on their many-years-long trip. This cylinder has been specially designed to give maximum radiation of heat—a serious problem in such vessels. (Remember there is no air in space to waft away heat by convection.)

The long central cylinder contains the engines. These are of a very special kind. They are ion-producers. A star ship could not possibly carry enough chemical fuel to take it over the vast distances of interstellar space. Instead, the ship will be propelled by a stream of electrically accelerated charged atoms (ions). These will pour out from the thin jets at the rear of the ship and keep it moving constantly forward at high velocity.

Perhaps the most intriguing thing about these engines is that they devour themselves! As parts become worn out or burned out, they are fed to the ion producers and disintegrated. In this way, the mass of the ship is gradually reduced as it moves farther along its course.

Such a ship would probably take something like 500 years to reach a fairly near star system. It would not take less than 100 years, and it might well take 1,000 years. This is a one-way trip for the passengers.

Next month we will see our star ship out in the depths of remote space, tackling what will no doubt be fairly common, an emergency

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